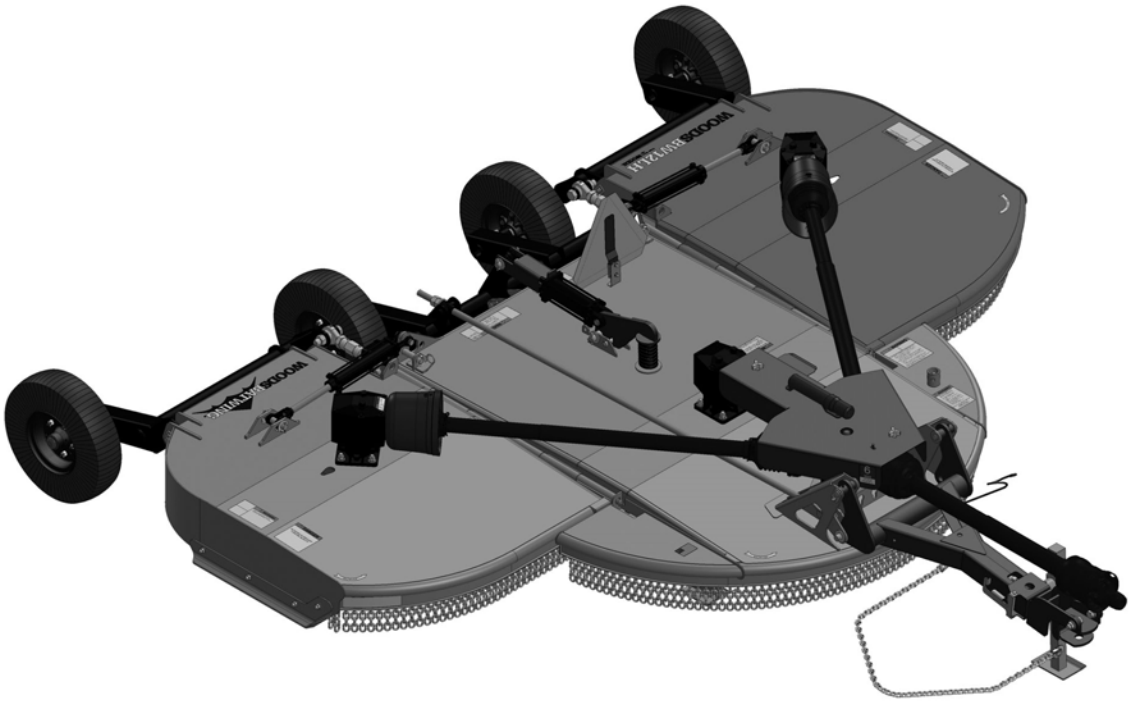
# WOODS

# BATWING®
# ROTARY CUTTER

## BW12



OPERATOR'S MANUAL

MAN1078
(Rev. 3/11/2015)

WOODS®
Woods Equipment Company

**TO THE DEALER:**

Assembly and proper installation of this product is the responsibility of the Woods® dealer. Read manual instructions and safety rules. Make sure all items on the Dealer's Pre-Delivery and Delivery Check Lists in the Operator's Manual are completed before releasing equipment to the owner.

**The dealer must complete the online Product Registration form at the Woods Dealer Website** which certifies that all Dealer Check List items have been completed. Dealers can register all Woods product at dealer.WoodsEquipment.com under Product Registration.

**Failure to register the product does not diminish customer's warranty rights.**

**TO THE OWNER:**

Read this manual before operating your Woods equipment. The information presented will prepare you to do a better and safer job. Keep this manual handy for ready reference. Require all operators to read this manual carefully and become acquainted with all adjustment and operating procedures before attempting to operate. Replacement manuals can be obtained from your dealer. To locate your nearest dealer, check the Dealer Locator at www.WoodsEquipment.com, or in the United States and Canada call 1-800-319-6637.

The equipment you have purchased has been carefully engineered and manufactured to provide dependable and satisfactory use. Like all mechanical products, it will require cleaning and upkeep. Lubricate the unit as specified. Observe all safety information in this manual and safety decals on the equipment.

For service, your authorized Woods dealer has trained mechanics, genuine Woods service parts, and the necessary tools and equipment to handle all your needs.

Use only genuine Woods service parts. Substitute parts will void the warranty and may not meet standards required for safe and satisfactory operation. Record the model number and serial number of your equipment in the spaces provided:

**Model:** _____ **Date of Purchase:** _____

**Serial Number: (see Safety Decal section for location)** _____

Provide this information to your dealer to obtain correct repair parts.

Throughout this manual, the term **NOTICE** is used to indicate that failure to observe can cause damage to equipment. The terms **CAUTION, WARNING,** and **DANGER** are used in conjunction with the Safety-Alert Symbol (a triangle with an exclamation mark) to indicate the degree of hazard for items of personal safety.

This is the safety alert symbol. It is used to alert you to potential physical injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

**DANGER** Indicates a hazardous situation that, if not avoided, will result in death or serious injury.

**WARNING** Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

**CAUTION** Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

**IMPORTANT** or ***NOTICE*** Is used to address practices not related to physical injury.

**NOTE** Indicates helpful information.

**ALITEC™**
**BMP®**
**CENTRAL FABRICATORS®**
**GANNON®**
**GILL®**
**WAIN-ROY®**
**WOODS®**

WOODS®
Woods Equipment Company

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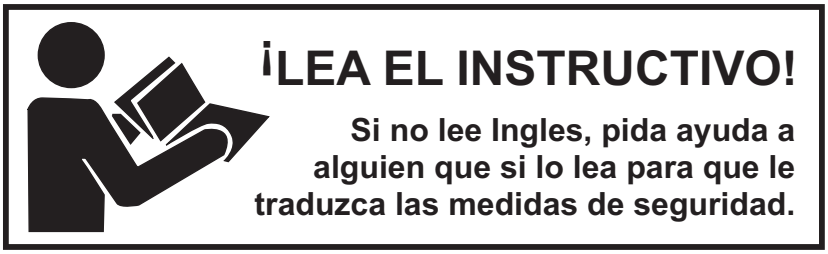



**NOTICE:**

If you would like to receive a free Spanish language translation of the Safety Rules section of this manual, plus a set of Spanish language safety decals, please contact your local Woods dealer.

**AVISO:**

Si desea recibir una traducción al español gratuita de la sección Reglas de seguridad de este manual y un juego de etiquetas de seguridad en español, por favor comuníquese con su concesionario local de Woods.

**This Operator's Manual should be regarded as part of the machine. Suppliers of both new and second-hand machines must make sure that this manual is provided with the machine.**

# SPECIFICATIONS

| | BW12 |
|---|---|
| Cutting Height (Varies with tire selection) | 2 - 12" |
| Cutting Width | 144" (12') |
| Overall Width | 152" |
| Transport Width | 96" |
| Tractor HP | 35-65 |
| Blade Spindle | 3 |
| Blade Overlap | 6" |
| Number of Blades | 6 |
| Blade Rotation | Left Spindle: CW; Right & Center Spindles: CCW |
| Side Frame Thickness | 7 ga |
| Weight (approximate lbs.) | 2500 |
| Wheel Size | 21" OD Solid Tires, 24" Airplane Tires |
| Torsion Protection | Slip Clutch |
| Tractor PTO rpm | 540 |
| Blade Speed (Feet per minute) | 14,900 (wing), 14,300 (center) |

# GENERAL INFORMATION

**⚠ WARNING**

■ **Some illustrations in this manual show the equipment with safety shields removed to provide a better view. This equipment should never be operated with any necessary safety shielding removed.**

The purpose of this manual is to assist you in operating and maintaining your cutter. Read it carefully. It furnishes information and instructions that will help you achieve years of dependable performance. These instructions have been compiled from extensive field experience and engineering data. Some information may be general in nature due to unknown and varying operating conditions. However, through experience and these instructions, you should be able to develop procedures suitable to your particular situation.

The illustrations and data used in this manual were current at the time of printing but, due to possible inline production changes, your machine may vary slightly in detail. We reserve the right to redesign and change the machines as may be necessary without notification.

Throughout this manual, references are made to right and left directions. These are determined by standing behind the equipment facing the direction of forward travel. Blade rotation is clockwise (left wing) and counterclockwise (right wing and center section) as viewed from the top of the cutter.

**BE SAFE!**

**BE ALERT!**

**BE ALIVE!**

**BE TRAINED**
**Before Operating Mowers!**

ASSOCIATION OF EQUIPMENT MANUFACTURERS

*Safety Training*
*Does Make a Difference.*

---

# Free Mower Safety Video

Fill out and return the order form and we will send you a FREE VHS or DVD video outlining ***Industrial and Agricultural Mower Safety Practices***. The 22 minute video, developed in cooperation with AEM (Association of Equipment Manufacturers), reinforces the proper procedures to follow while operating your mowing equipment. The video does not replace the information contained in the Operator's Manual, so please review this manual thoroughly before operating your new mowing equipment.

**Also, available from the Association of Equipment Manufacturers:**

A large variety of training materials (ideal for groups) are available for a nominal charge from AEM. Following is a partial list:

- **Training Package for Rotary Mowers/Cutters-English**
  Contains: DVD & VHS (English)
  Guidebook for Rotary Mowers/Cutters (English)
  AEM Industrial/Agricultural Mower Safety Manual (English)
  AEM Agricultural Tractor Safety Manual (English)

- **Training Package for Rotary Mowers/Cutters-English/Spanish**
  Contains: DVD & VHS (English/Spanish)
  Guidebook for Rotary Mowers/Cutters (English/Spanish)
  AEM Industrial/Agricultural Mower Safety Manual (English/Spanish)
  AEM Agricultural Tractor Safety Manual (English/Spanish)

AEM training packages are available through:

AEM at: *www.aem.org*
or
Universal Lithographers, Inc.
Email: aem@ulilitho.com
800-369-2310 tel
866-541-1668 fax

# Free Mower/Cutter Safety Video Order Form

Please send me

✓ (Select one)
☐ **VHS** Format - VHS01052 Safety Video
☐ **DVD** Format - DVD01052 Safety Video

Name: _____ Phone: _____

Address: _____

_____

_____

Mower/Cutter Model: _____ Serial #: _____

Send to: ATTENTION: DEALER SERVICES
**WOODS EQUIPMENT COMPANY**
PO BOX 1000
OREGON IL 61061-1000
USA

# SAFETY RULES

## ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by an operator's single careless act.

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, judgement, and proper training of personnel involved in the operation, transport, maintenance, and storage of equipment.

It has been said, "The best safety device is an informed, careful operator." We ask you to be that kind of operator.

### INSTALLATION

■ **Hydraulics must be connected as instructed in this manual. Do not substitute parts, modify, or connect in any other way.**

### TRAINING

■ **Safety instructions are important! Read all attachment and power unit manuals; follow all safety rules and safety decal information. (Replacement manuals and safety decals are available from your dealer. To locate your nearest dealer, check the Dealer Locator at www.WoodsEquipment.com, or in the United States and Canada call 1-800-319-6637.) Failure to follow instructions or safety rules can result in serious injury or death.**

■ **If you do not understand any part of this manual and need assistance, see your dealer.**

■ **Know your controls and how to stop engine and attachment quickly in an emergency.**

■ **Operators must be instructed in and be capable of the safe operation of the equipment, its attachments, and all controls. Do not allow anyone to operate this equipment without proper instructions.**

■ **Keep hands and body away from pressurized lines. Use paper or cardboard, not hands or other body parts to check for leaks. Wear safety goggles. Hydraulic fluid under pressure can easily penetrate skin and will cause serious injury or death.**

■ **Make sure that all operating and service personnel know that if hydraulic fluid penetrates skin, it must be surgically removed as soon as possible by a doctor familiar with this form of injury or gangrene, serious injury, or death will result. CONTACT A PHYSICIAN IMMEDIATELY IF FLUID ENTERS SKIN OR EYES. DO NOT DELAY.**

■ **Never allow children or untrained persons to operate equipment.**

### PREPARATION

■ **Check that all hardware is properly installed. Always tighten to torque chart specifications unless instructed otherwise in this manual.**

■ **Air in hydraulic systems can cause erratic operation and allows loads or equipment components to drop unexpectedly. When connecting equipment or hoses or performing any hydraulic maintenance, purge any air in hydraulic system by operating all hydraulic functions several times. Do this before putting into service or allowing anyone to approach the equipment.**

■ **Make sure all hydraulic hoses, fittings, and valves are in good condition and not leaking before starting power unit or using equipment. Check and route hoses carefully to prevent damage. Hoses must not be twisted, bent sharply, kinked, frayed, pinched, or come into contact with any moving parts. Operate moveable components through full operational range to check clearances. Replace any damaged hoses immediately.**

■ **After connecting hoses, check that all control lever positions function as instructed in the Operator's Manual. Do not put into service until control lever and equipment movements are correct.**

■ **Set tractor hydraulic relief valve at 2500 psi (170 bars) (17,000 kPa) to prevent injury and equipment damage due to hydraulic system failure.**

■ **Your dealer can supply original equipment hydraulic accessories and repair parts. Substitute parts may not meet original equipment specifications and may be dangerous.**

■ **Always wear relatively tight and belted clothing to avoid getting caught in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head; and respirator or filter mask where appropriate.**

■ **Make sure attachment is properly secured, adjusted, and in good operating condition.**

■ **Make sure spring-activated locking pin or collar slides freely and is seated firmly in tractor PTO spline groove.**

*(Safety Rules continued on next page)*

# SAFETY RULES

## ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

*(Safety Rules continued from previous page)*

■ **Make sure driveline guard tether chains are attached to the tractor and equipment as shown in the pamphlet that accompanies the driveline. Replace if damaged or broken. Check that driveline guards rotate freely on driveline before putting equipment into service.**

■ **Before starting power unit, check all equipment driveline guards for damage. Replace any damaged guards. Make sure all guards rotate freely on all drivelines. If guards do not rotate freely on drivelines, repair and replace bearings before putting equipment into service.**

■ **Power unit must be equipped with ROPS or ROPS cab and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS system in "locked up" position at all times.**

■ **Remove accumulated debris from this equipment, power unit, and engine to avoid fire hazard.**

■ **Make sure all safety decals are installed. Replace if damaged. (See Safety Decals section for location.)**

■ **Make sure shields and guards are properly installed and in good condition. Replace if damaged.**

■ **Do not put this equipment into service unless all side skids are properly installed and in good condition. Replace if damaged.**

■ **A minimum 20% of tractor and equipment weight must be on the tractor front wheels when attachments are in transport position. Without this weight, front tractor wheels could raise up resulting in loss of steering. The weight may be attained with front wheel weights, ballast in tires or front tractor weights. Weigh the tractor and equipment. Do not estimate.**

■ **Inspect and clear area of stones, branches, or other hard objects that might be thrown, causing injury or damage.**

■ **Connect PTO driveline directly to power unit PTO shaft. Never use adapter sleeves or adapter shafts. Adapters can cause driveline failures due to incorrect spline or incorrect operating length and can result in personal injury or death.**

### TRANSPORTATION

■ **Power unit must be equipped with ROPS or ROPS cab and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS system in "locked up" position at all times.**

■ **Always raise unit and install transport locks before transporting. Leak down or failure of mechanical or hydraulic system can cause equipment to drop.**

■ **Always attach safety chain to tractor drawbar when transporting unit.**

■ **Always comply with all state and local lighting and marking requirements.**

■ **Never allow riders on power unit or attachment.**

■ **Do not operate PTO during transport.**

■ **Do not operate or transport on steep slopes.**

■ **Do not operate or transport equipment while under the influence of alcohol or drugs.**

■ **The maximum transport speed for towed and semi-mounted machines is 20 mph (32 km/h). Regardless of the maximum speed capability of the towing tractor, do not exceed the implement's maximum transport speed. Doing so could result in:**

- **Loss of control of the implement and tractor**
- **Reduced or no ability to stop during braking**
- **Implement tire failure**
- **Damage to the implement or its components.**

■ **Use additional caution and reduce speed when under adverse surface conditions, turning, or on inclines.**

■ **Never tow this implement with a motor vehicle.**

### OPERATION

■ **Do not allow bystanders in the area when operating, attaching, removing, assembling, or servicing equipment.**

■ **Never walk, stand, or place yourself or others under a raised wing or in the path of a lowering wing. Hydraulic system leak-down, hydraulic system failures, mechanical failures, or movement of control levers can cause wings to drop unexpectedly and cause severe injury or death.**

*(Safety Rules continued on next page)*

# SAFETY RULES

## ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

*(Safety Rules continued from previous page)*

■ **Full chain shielding must be installed at all times. Thrown objects could injure people or damage property.**

- **If the machine is not equipped with full chain shielding, operation must be stopped.**
- **This shielding is designed to reduce the risk of thrown objects. The mower deck and protective devices cannot prevent all objects from escaping the blade enclosure in every mowing condition. It is possible for objects to ricochet and escape, traveling as much as 300 feet (92m).**

■ **Never direct discharge toward people, animals, or property.**

■ **Do not operate or transport equipment while under the influence of alcohol or drugs.**

■ **Operate only in daylight or good artificial light.**

■ **Keep hands, feet, hair, and clothing away from equipment while engine is running. Stay clear of all moving parts.**

■ **Always comply with all state and local lighting and marking requirements.**

■ **Never allow riders on power unit or attachment.**

■ **Power unit must be equipped with ROPS or ROPS cab and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS system in "locked up" position at all times.**

■ **Always sit in power unit seat when operating controls or starting engine. Securely fasten seat belt, place transmission in neutral, engage brake, and ensure all other controls are disengaged before starting power unit engine.**

■ **Operate tractor PTO at 540 RPM. Do not exceed.**

■ **Raise or lower wings slowly to prevent personal injury or damage to cutter.**

■ **Look down and to the rear and make sure area is clear before operating in reverse.**

■ **Do not operate or transport on steep slopes.**

■ **Do not stop, start, or change directions suddenly on slopes.**

■ **Watch for hidden hazards on the terrain during operation.**

■ **Stop power unit and equipment immediately upon striking an obstruction. Turn off engine, remove key, inspect, and repair any damage before resuming operation.**

■ **Continuous operation while the clutch is slipping could cause heat build-up resulting in fire. Adjust slip clutch pressure by tightening springs to the dimension shown in the "Owner Service" section. If clutch is set to minimum spring length, replace the friction disks as shown.**

## MAINTENANCE

■ **Before servicing, adjusting, repairing or unplugging, stop tractor engine, place all controls in neutral, set park brake, remove ignition key, and wait for all moving parts to stop.**

■ **Before dismounting power unit or performing any service or maintenance, follow these steps: disengage power to equipment, lower the 3-point hitch and all raised components to the ground, operate valve levers to release any hydraulic pressure, set parking brake, stop engine, remove key, and unfasten seat belt.**

■ **Do not modify or alter or permit anyone else to modify or alter the equipment or any of its components in any way.**

■ **Your dealer can supply original equipment hydraulic accessories and repair parts. Substitute parts may not meet original equipment specifications and may be dangerous.**

■ **To prevent contamination during maintenance and storage, clean and then cover hose ends, fittings, and hydraulic ports with tape.**

■ **Do not allow bystanders in the area when operating, attaching, removing, assembling, or servicing equipment.**

*(Safety Rules continued on next page)*

# SAFETY RULES

## ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

*(Safety Rules continued from previous page)*

■ **Never go underneath equipment (lowered to the ground or raised) unless it is properly blocked and secured. Never place any part of the body underneath equipment or between moveable parts even when the engine has been turned off. Hydraulic system leak down, hydraulic system failures, mechanical failures, or movement of control levers can cause equipment to drop or rotate unexpectedly and cause severe injury or death. Follow Operator's Manual instructions for working underneath and blocking requirements or have work done by a qualified dealer.**

■ **Keep all persons away from operator control area while performing adjustments, service, or maintenance.**

■ **Make certain all movement of equipment components has stopped before approaching for service.**

■ **Frequently check blades. They should be sharp, free of nicks and cracks, and securely fastened.**

■ **Do not handle blades with bare hands. Careless or improper handling may result in serious injury.**

■ **Your dealer can supply genuine replacement blades. Substitute blades may not meet original equipment specifications and may be dangerous.**

■ **Tighten all bolts, nuts, and screws to torque chart specifications. Check that all cotter pins are installed securely to ensure equipment is in a safe condition before putting unit into service.**

■ **Make sure all safety decals are installed. Replace if damaged. (See Safety Decals section for location.)**

■ **Make sure shields and guards are properly installed and in good condition. Replace if damaged.**

■ **Never perform service or maintenance with engine running.**

■ **Do not disconnect hydraulic lines until machine is securely blocked or placed in lowest position and system pressure is released by operating valve levers.**

■ **Service and maintenance work not covered in OWNER SERVICE must be done by a qualified dealership. Special skills, tools, and safety procedures may be required. Failure to follow these instructions can result in serious injury or death.**

■ **Explosive separation of tire and rim parts can cause serious injury or death. Release all air pressure before loosening bolts on wheel.**

## STORAGE

■ **Before disconnecting and storing, follow these instructions:**

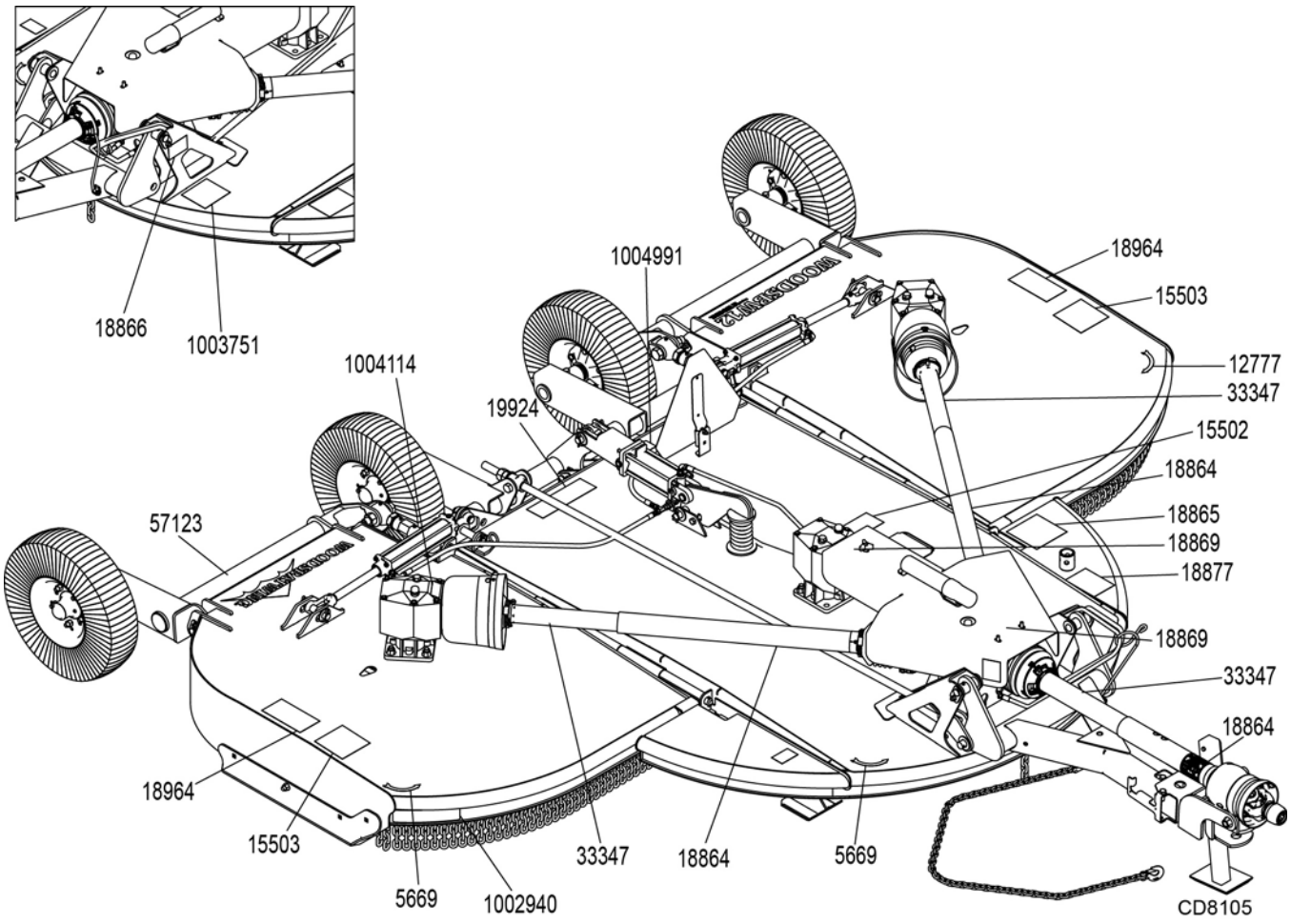
- **Store on level, solid ground.**
- **Disconnect driveline and secure up off the ground.**
- **Lower wings to ground.**
- **Raise cutter center section and pin transport bar in raised position.**
- **Attach parking jack and raise tongue weight off tractor drawbar.**
- **Place wedge blocks at front and rear of wheels on center section and each wing to prevent wheel rotation.**
- **Securely block all four corners of center section and each wing with jackstands.**
- **Remove hydraulic hoses after tractor is turned off and all system pressure is released by operating valve levers several times.**
- **Remove safety tow chain.**
- **Remove retainer pin and high strength drawbar pin.**

■ **Keep children and bystanders away from storage area.**

# SAFETY & INSTRUCTIONAL DECALS

**ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!**

**Replace Immediately If Damaged!**




**PN 1006348 - Located on Wheel Rims**

| ⚠ WARNING | EXPLOSION HAZARD |
|---|---|
| RELEASE ALL AIR PRESSURE BEFORE LOOSENING BOLTS. FAILURE TO DO SO COULD RESULT IN SERIOUS INJURY. MAX. SPEED: 20 MPH, MAX. WEIGHT: 4000 LBS., MAX AIR PRESSURE: 40 PSI | |

## BE CAREFUL!

Use a clean, damp cloth to clean safety decals.

Avoid spraying too close to decals when using a pressure washer; high-pressure water can enter through very small scratches or under edges of decals causing them to peel or come off.

Replacement safety decals can be ordered free from your Woods dealer. To locate your nearest dealer, check the Dealer Locator at www.WoodsEquipment.com, or in the United States and Canada call 1-800-319-6637.

**1 - SERIAL NUMBER PLATE**

**2 - FRONT AMBER REFLECTOR (PN 1002940)**

**3 - REAR RED REFLECTOR (PN 57123)**

**4 - PN 18869**

| ⚠ DANGER | |
|---|---|
| SHIELD MISSING<br>DO NOT OPERATE - PUT SHIELD ON | 18869-B |

# SAFETY & INSTRUCTIONAL DECALS

## ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

**Replace Immediately If Damaged!**

**6 - PN 18866**
**(540 RPM)**

**WARNING**

**DO NOT EXCEED PTO SPEED OF**
**540 RPM**

**PTO speeds higher than 540 RPM can cause equipment failure and personal injury.**

18866-D

**8 - PN 18864**

**DANGER**

***ROTATING DRIVELINE***
**CONTACT CAN CAUSE DEATH**
***KEEP AWAY!***
**DO NOT OPERATE WITHOUT -**

- **All driveline guards, tractor and equipment shields in place**
- **Drivelines securely attached at both ends**
- **Driveline guards that turn freely on driveline**

18864-C

**17 - PN 1004114**

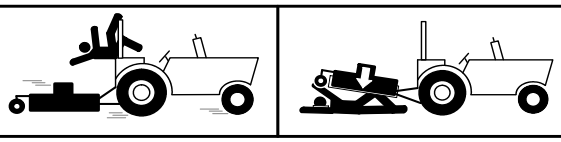
**DANGER**

**If shaft connection is visible, shield is missing. Replace shield before operating equipment.**

1004114

**9 - PN 18865**

**WARNING**



**FALLING OFF CAN RESULT IN BEING RUN OVER.**

- Tractor must be equipped with ROPS (or ROPS CAB) and seat belt. Keep foldable ROPS systems in "locked up" position at all times.
- Buckle Up! Keep seat belt securely fastened.
- Allow no riders.

**RAISED EQUIPMENT CAN DROP AND CRUSH.**

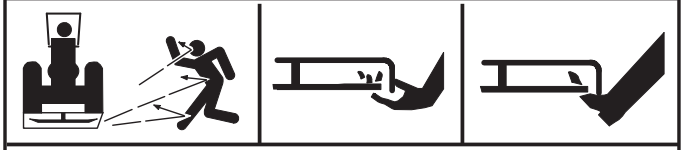
- Before working underneath, follow all instructions and safety rules in operator's manual and securely block up all corners of equipment with jack stands.
- Securely blocking prevents equipment dropping from hydraulic leak-down, hydraulic system failures or mechanical component failures.

**FALLING OFF OR FAILING TO BLOCK SECURELY CAN RESULT IN SERIOUS INJURY OR DEATH.**

18865–C

**7 - PN 15503**

**DANGER**



**ROTATING BLADES AND THROWN OBJECTS**

- **Do not put hands or feet under or into mower when engine is running.**
- **Before mowing, clear area of objects that may be thrown by blade.**
- **Keep bystanders away.**
- **Keep guards in place and in good condition.**

**BLADE CONTACT OR THROWN OBJECTS CAN CAUSE SERIOUS INJURY OR DEATH.**

15503-C

**11 - PN 19924**

19924-B

**WARNING**

**HIGH-PRESSURE HYDRAULIC OIL LEAKS CAN PENETRATE SKIN RESULTING IN SERIOUS INJURY, GANGRENE OR DEATH.**

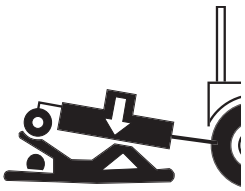
- Check for leaks with cardboard; never use hand.
- Before loosening fittings: lower load, release pressure, and be sure oil is cool.
- Consult physician immediately if skin penetration occurs.

# SAFETY & INSTRUCTIONAL DECALS

## ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

**Replace Immediately If Damaged!**

**12 - PN 1004991**



1004991

**WARNING**

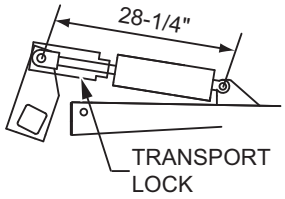
**RAISED CUTTER CAN DROP AND CRUSH**

- Cutters must be equipped with transport lock.
- Before working underneath, transport lock must be in the raised position. All corners of cutter must be securely blocked with jack stands.
- All transport components must be functional, kept in good condition, and stored on equipment.
- Blocking up prevents cutter dropping from hydraulic leak down, hydraulic system failures, or mechanical component failures.

**FAILURE TO FOLLOW INSTRUCTIONS CAN RESULT IN SERIOUS INJURY OR DEATH.**

**TRANSPORT LOCK AND CYLINDER REQUIREMENTS**

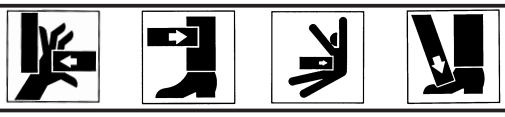
SINGLE-ACTING FULL EXTENSION




**10 - PN 33347**

**13 - PN 1003751**

**WARNING**



**CRUSHING AND PINCHING HAZARD**

- Be extremely careful handling various parts of the machine. They are heavy and hands, fingers, feet, and other body parts could be crushed or pinched between tractor and implement.
- Operate tractor controls from tractor seat only.
- Do not stand between tractor and implement when tractor is in gear.
- Make sure parking brake is engaged before going between tractor and implement.
- Stand clear of machine while in operation or when it is being raised or lowered.

**FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS INJURY OR DEATH.**

1003751-A

**14 - PN 18877**

**WARNING**

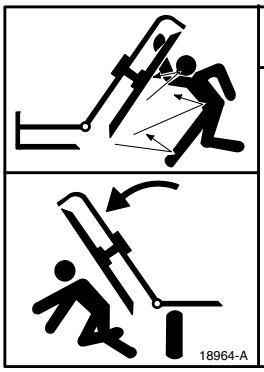
**TO AVOID SERIOUS INJURY OR DEATH:**

- Read Operator's Manual (available from dealer) and follow all safety precautions.
- Keep all shields in place and in good condition.
- Operate mower from tractor seat only.
- Lower mower, stop engine and remove key before dismounting tractor.
- Allow no children or untrained persons to operate equipment.
- Do not transport towed or semi-mounted units over 20 mph.

**FAILURE TO OPERATE SAFELY CAN RESULT IN INJURY OR DEATH.**

18877-C

**15 - PN 18964**



18964-A

**WARNING**

**RAISED WING EXPOSES BLADE AND INCREASES THROWN OBJECT HAZARDS.**

- Only raise for transport. Stop cutter and lock wing(s) up.

**RAISED WING CAN FALL AND CRUSH.**

- Keep away.
- Lock up with wing transport bars.
- Lower wing(s) after transport and for storage.

**FAILURE TO FOLLOW INSTRUCTIONS CAN RESULT IN SERIOUS INJURY OR DEATH.**

**16 - PN 15502**

**WARNING**

**ROTATING COMPONENTS**

**Do not operate without cover in place.**

**Look and listen for rotation. Do not open cover until all components have stopped.**

**CONTACT WITH ROTATING PARTS CAN CAUSE SERIOUS INJURY.**

15502-B

# OPERATION

The designed and tested safety of this machine depends on it being operated within the limitations as explained in this manual. Be familiar with and follow all safety rules in the manual, on the cutter and on the tractor.

The safe operation of this cutter is the responsibility of the operator, who must be properly trained. The operator should be familiar with the equipment and all safety practices before starting operation. Read the safety information on page 7 through page 13.

Recommended tractor ground speed for most conditions is from 1 to 6 mph.

Always operate tractor PTO at 540 rpm.

**⚠ DANGER**

■ **Full chain shielding must be installed at all times. Thrown objects could injure people or damage property.**

- **If the machine is not equipped with full chain shielding, operation must be stopped.**
- **This shielding is designed to reduce the risk of thrown objects. The mower deck and protective devices cannot prevent all objects from escaping the blade enclosure in every mowing condition. It is possible for objects to ricochet and escape, traveling as much as 300 feet (92m).**

**⚠ WARNING**

■ **Never allow children or untrained persons to operate equipment.**

■ **Do not allow bystanders in the area when operating, attaching, removing, assembling, or servicing equipment.**

■ **Make sure spring-activated locking pin or collar slides freely and is seated firmly in tractor PTO spline groove.**

**⚠ CAUTION**

■ **Stop power unit and equipment immediately upon striking an obstruction. Turn off engine, remove key, inspect, and repair any damage before resuming operation.**

■ **Always wear relatively tight and belted clothing to avoid getting caught in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head; and respirator or filter mask where appropriate.**

## CONNECTING CUTTER TO TRACTOR

### *NOTICE*

■ **For tractors with a 1-3/8" diameter PTO shaft, the horizontal distance from the end of the tractor PTO shaft to the center of drawbar pin should be 14" for 540 rpm cutter. This will minimize joint knock and damage to drive components.**

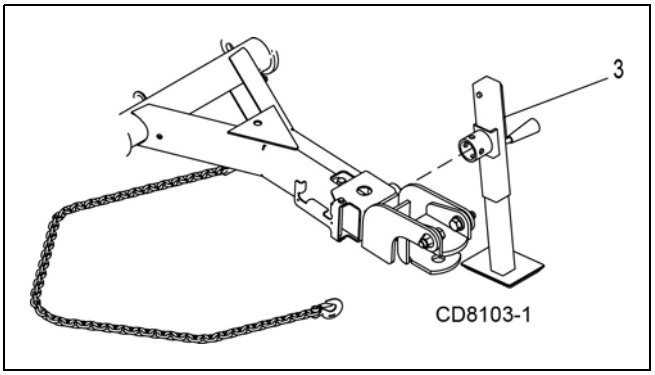



**Figure 1**. Cutter to Tractor Connection

1. Attach cutter using a 1-1/8" clevis pin and clip.
2. Attach safety tow chain to drawbar support. Leave enough slack for turning (Figure 1).
3. Connect cutter driveline to tractor PTO shaft, making sure the spring-activated lock pin slides freely and is seated in tractor PTO splined groove.
4. Remove parking jack (3) from the tongue and attach it to the storage post on the front of the unit.

### Hydraulic Connection

1. Inspect hydraulic hoses to ensure they are in good condition.
2. Clean the fittings before connecting them to the tractor hydraulic ports.
3. Route the hose through the hose holder at the hitch and be sure the hose can slide freely in the holder. Do not allow hose slack to drag on the ground or become caught on tractor protrusions.
4. Attach the hydraulic hose to the tractor.
5. From the operator position, start tractor and raise and lower deck several times to purge trapped air from the hydraulic cylinder.

### Interference Check

1. Be sure that tractor 3-point lift links do not interfere with hydraulic hoses, cutter driveline, or cutter frame.

2. Check for straight-ahead operation and at full turning angles. If there is any interference, remove the lower lift links.
3. Contact between tractor lift links and cutter parts can cause damage, especially when turning.

### CV Driveline Turning Limits

***NOTICE***

■ **You must not exceed a turning angle of 80 degrees at the head of the Constant Velocity driveline or damage will occur.**

1. To check for potential excessive turn angle, disconnect the driveline from tractor.
2. Start engine and turn as far right or left as possible.
3. Shut engine off and try to connect CV driveline to tractor. If it cannot be connected, the turn angle is too severe.
4. Restart engine and straighten angle slightly, shut off engine and try to connect CV driveline to tractor.
5. Repeat the process until the driveline can be connected. The point at which the driveline can be connected is the maximum turn that should be made.

### Cutting Height Adjustment

**⚠ WARNING**

***NOTICE***

■ **Avoid ground contact with blades. Striking ground with blades produces one of the most damaging shock loads a cutter can encounter. If this occurs repeatedly, the cutter, driveline, and gearboxes will be damaged.**

Cutting height range is from 2" to 12".

When selecting a cutting height, you should consider the area of operation. If the ground is rolling and has mounds the blades could contact, set the cutting height accordingly. The cutting height (blade edge) is approximately 1" above the bottom of the side skid.

#### Cutting Height (Normal Mowing) - Center Section

**NOTE:** Cutter is set at factory for tires that it shipped with and a 16.5" tractor drawbar height. The adjustment is only needed for different drawbar height or to change shredding amount, and should be verified upon delivery.

1. Position the cutter on a hard level surface and select an approximate cutting height, Example 6".
2. Raise wings and lock them in the UP position.
3. Raise or lower the center section to obtain a distance of 5" from bottom edge of skid shoe to the ground.
4. Loosen jam nuts on the attitude rod that runs from the wheel yoke to the tongue.
5. Adjust rod in or out until the rear of the cutter is approximately 1/2" higher than the front.
6. Tighten jam nuts against sleeve.

#### Cutting Height (Normal Mowing) - Wings

**NOTE:** Cutter is adjusted at factory for wings to remain parallel to center frame through full range of cut.

1. Lower wings to normal mowing position.
2. Loosen the jam nut on the adjustable link (turn buckle).
3. Lengthening the link will raise the wing, shortening the link will lower the wing. The rear edge of the wing should be parallel to the ground.

When using the cutter to shred, the rear of the cutter deck should be approximately 1/2" to 1" lower than the front.

## TRACTOR OPERATION

Use care when operating around tree limbs and other low objects. Avoid being knocked off tractor and being injured.

Only use a tractor with a Roll Over Protection Structure (ROPS) and seat belt. Securely fasten seat belt.

The cutter is operated with tractor controls. Engage the PTO at a low rpm to prevent excessive loads on the cutter drive system. Increase throttle to recommended PTO operating RPM.

Be sure operator is familiar with all controls and can stop tractor and cutter quickly in an emergency. The operator should give complete, undivided attention to operating tractor and cutter.

## CUTTER OPERATION

When beginning operation of the cutter, make sure that all persons are in a safe location.

Power for operating the cutter is supplied by the tractor PTO. Operate PTO at 540.

Know how to stop the tractor and cutter quickly in an emergency.

Engage PTO at a low engine, rpm to minimize stress on the drive system and gearbox.

With PTO engaged, raise PTO speed to 540 and maintain throughout cutting operation.

Gearbox protection is provided by a slip clutch with replacement fiber disc. The slip clutch is designed to slip when excessive torsional loads occur.

Move slowly into material. Adjust tractor ground speed to provide a clean cut without lugging the tractor engine.

Use a slow ground speed for better shredding.

Proper ground speed will depend on the terrain and the material's height, type, and density.

Normally, ground speed will range from 2 to 5 mph. Tall, dense material should be cut at a low speed; thin, medium-height material can be cut at a faster ground speed.

Always operate tractor PTO at proper 540 RPM to maintain blade speed and to produce a clean cut.

Under certain conditions tractor tires may roll down some grass and prevent cutting at the same height as the surrounding area. When this occurs, reduce your ground speed but maintain PTO at 540 RPM. The lower ground speed will permit grass to rebound partially.

### Mowing Tips

**⚠ WARNING**

- **Look down and to the rear and make sure area is clear before operating in reverse.**

**⚠ WARNING**

- **Do not operate or transport on steep slopes.**
- **Do not stop, start, or change directions suddenly on slopes.**
- **Use extreme care and reduce ground speed on slopes and rough terrain.**
- **Watch for hidden hazards on the terrain during operation.**

**⚠ CAUTION**

- **Stop power unit and equipment immediately upon striking an obstruction. Turn off engine, remove key, inspect, and repair any damage before resuming operation.**

Maximum recommended ground speed for cutting or shredding is 6 miles per hour. Adjust tractor ground speed by using higher or lower gears to provide a clean cut without lugging tractor engine.

Tall material should be cut twice. Cut material higher the first pass. Cut at desired height at 90 degrees the second pass.

Remember, sharp blades produce cleaner cuts and use less power.

Before entering an area, analyze it to determine the best procedure. Consider the height and type of material to be cut and the terrain type (hilly, level or rough, etc.).

## TRANSPORTING

**⚠ WARNING**

- **Power unit must be equipped with ROPS or ROPS cab and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS system in "locked up" position at all times.**
- **Always raise unit and install transport locks before transporting. Leak down or failure of mechanical or hydraulic system can cause equipment to drop.**
- **Always attach safety chain to tractor drawbar when transporting unit.**
- **Never exceed 20 mph (32.2 km/h) during transport.**
- **Never allow riders on power unit or attachment.**
- **Do not operate PTO during transport.**
- **Do not operate or transport on steep slopes.**
- **Do not operate or transport equipment while under the influence of alcohol or drugs.**

**⚠ CAUTION**

- **Always comply with all state and local lighting and marking requirements.**

### Lock-Up

Always transport with wings and center frame in the raised, locked position.

#### Wing Lock-Up

1. Raise wing to the up position.
2. Remove safety pin from storage position.
3. Install safety pin in lock position. (See Figure 2)
4. Repeat steps 1 to 3 for opposite wing.

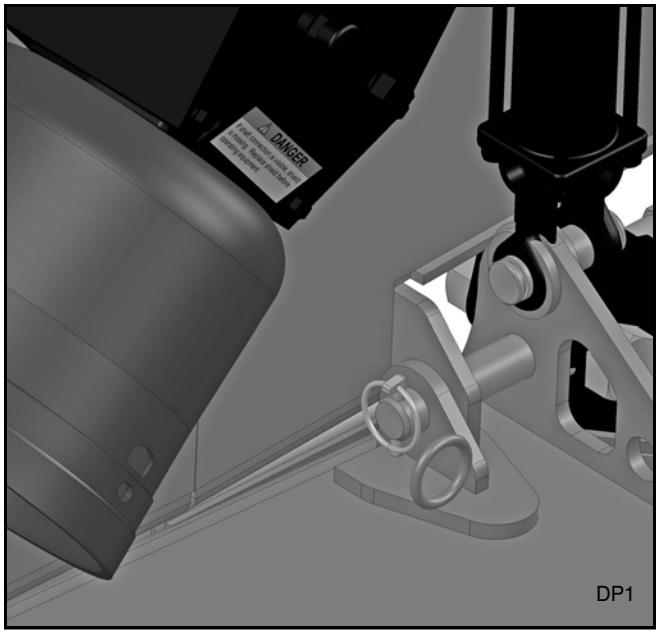



**Figure 2**. Transport Lock-Up Bar - Right Wing

**Center Section Lock-Up**

1. Raise cutter with hydraulic cylinder to maximum height.
2. Rotate transport lock into position over cylinder rod (Figure 3).

**Figure 3**. Transport Lock In Transport Position

3. Lower cutter against transport lock.
4. To lower cutter for operation, extend hydraulic cylinder to raise cutter. Rotate transport lock back away from cylinder rod (Figure 4).
5. Lower cutter to desired cutting height.

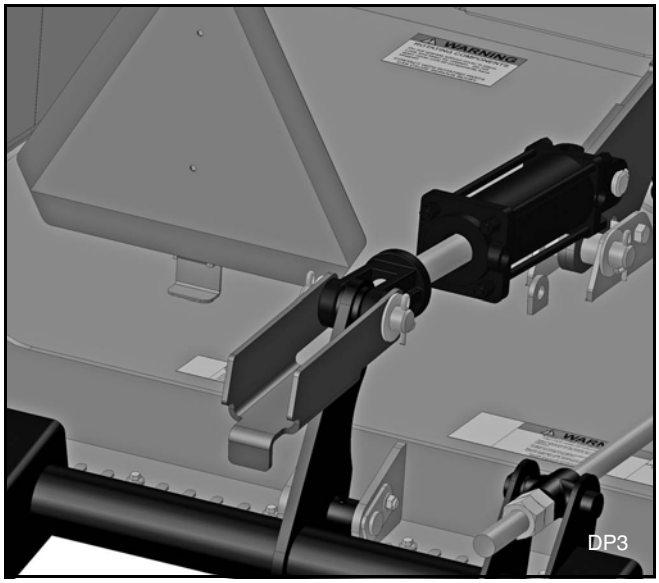



**Figure 4**. Transport Lock In Operation Position

## STORAGE

Follow these steps when storing your cutter:

1. Clean cutter before storing. See page 23 for cleaning instructions. Store on level, solid ground.
2. Disconnect driveline and secure up off the ground.
3. Lower wings to ground.
4. Raise cutter center section and pin transport bar in raised position.
5. Attach parking jack and raise tongue weight off tractor drawbar.
6. Place wedge blocks at front and rear of wheels on center section and each wing to prevent wheel rotation.
7. Securely block all four corners of center section and each wing with jack stands.
8. Remove hydraulic hoses after tractor is turned off and all system pressure is released by operating valve levers several times.
9. Remove safety tow chain.
10. Remove retainer pin and high strength drawbar pin.
11. Keep children and bystanders away from storage area.

## PRE-OPERATION CHECK LIST

(OWNER'S RESPONSIBILITY)

___ Review and follow all safety rules and safety decal instructions on page 7 through page 13.

___ Check that all safety decals are installed and in good condition. Replace if damaged.

___ Check that equipment is properly and securely attached to tractor.

___ Make sure driveline spring-activated locking pin or collar slides freely and is seated firmly in tractor PTO spline groove.

___ Check all lubrication points and grease as instructed in lubrication information. Make sure the PTO slip joint is lubricated and that the gearbox fluid levels are correct.

___ Set tractor PTO at correct rpm for your equipment.

___ Lubricate all grease fitting locations. Make sure PTO shaft slip joint is lubricated.

___ Check that all hydraulic hoses and fittings are in good condition and not leaking before starting tractor. Check that hoses are not twisted, bent sharply, kinked, frayed, or pulled tight. Replace any damaged hoses immediately.

___ Check that all hardware is properly installed and secured.

___ Check cutting height and attitude adjustment.

___ Raise and lower equipment to make sure air is purged from hydraulic cylinders and hoses.

___ Check that blades are sharp and secure and cutting edge is positioned to lead.

___ Make sure tractor ROPS or ROPS cab and seat belt are in good condition. Keep seat belt securely fastened during operation.

___ Check that shields and guards are properly installed and in good condition. Replace if damaged.

___ Before starting engine, operator must be in tractor seat with seat belt fastened. Place transmission in neutral or park, engage brake and disengage tractor PTO.

___ Inspect area to be cut and remove stones, branches, or other hard objects that might be thrown and cause injury or damage.

___ Inspect chain shielding and replace any damaged or missing links.

___ Make sure tractor 3-point lift links do not interfere with hydraulic hoses or driveline throughout full turning range.

# OWNER SERVICE

The information in this section is written for operators who possess basic mechanical skills. If you need help, your dealer has trained service technicians available. For your protection, read and follow the safety information in this manual.

**⚠ WARNING**

■ **Keep all persons away from operator control area while performing adjustments, service, or maintenance.**

■ **Before working underneath, disconnect driveline from tractor, lower wings to ground, raise cutter, and pin transport bar in raised position. Attach parking jack and lower to ground. Securely block all four corners of center section and each wing with jack stands. Blocking up prevents the cutter from dropping due to hydraulic leak down, hydraulic system failure, or mechanical component failure.**

■ **Service and maintenance work not covered in OWNER SERVICE must be done by a qualified dealership. Special skills, tools, and safety procedures may be required. Failure to follow these instructions can result in serious injury or death.**

■ **Before servicing, adjusting, repairing or unplugging, stop tractor engine, place all controls in neutral, set park brake, remove ignition key, and wait for all moving parts to stop.**

■ **Never perform service or maintenance with engine running.**

**⚠ CAUTION**

■ **If you do not understand any part of this manual and need assistance, see your dealer.**

■ **Always wear relatively tight and belted clothing to avoid entanglement in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head; and respirator or filter mask where appropriate.**

## BLOCKING METHOD

To minimize the potential hazards of working underneath the cutter, follow these procedures:

**⚠ WARNING**

■ **Before performing any service or maintenance, lower equipment to ground or block securely, turn off engine, remove key, and disconnect driveline from tractor PTO.**

■ **Never go underneath equipment (lowered to the ground or raised) unless it is properly blocked and secured. Never place any part of the body underneath equipment or between moveable parts even when the engine has been turned off. Hydraulic system leak down, hydraulic system failures, mechanical failures, or movement of control levers can cause equipment to drop or rotate unexpectedly and cause severe injury or death. Follow Operator's Manual instructions for working underneath and blocking requirements or have work done by a qualified dealer.**

Do not position jackstands under wheels, axles, or wheel supports. Components can rotate and cause cutter to fall.

1. Jackstands with a load rating of 1000 lbs. or more are the only approved blocking device for this cutter. Install jackstands (shown by **X**s in Figure 5) under the cutter before working underneath unit.

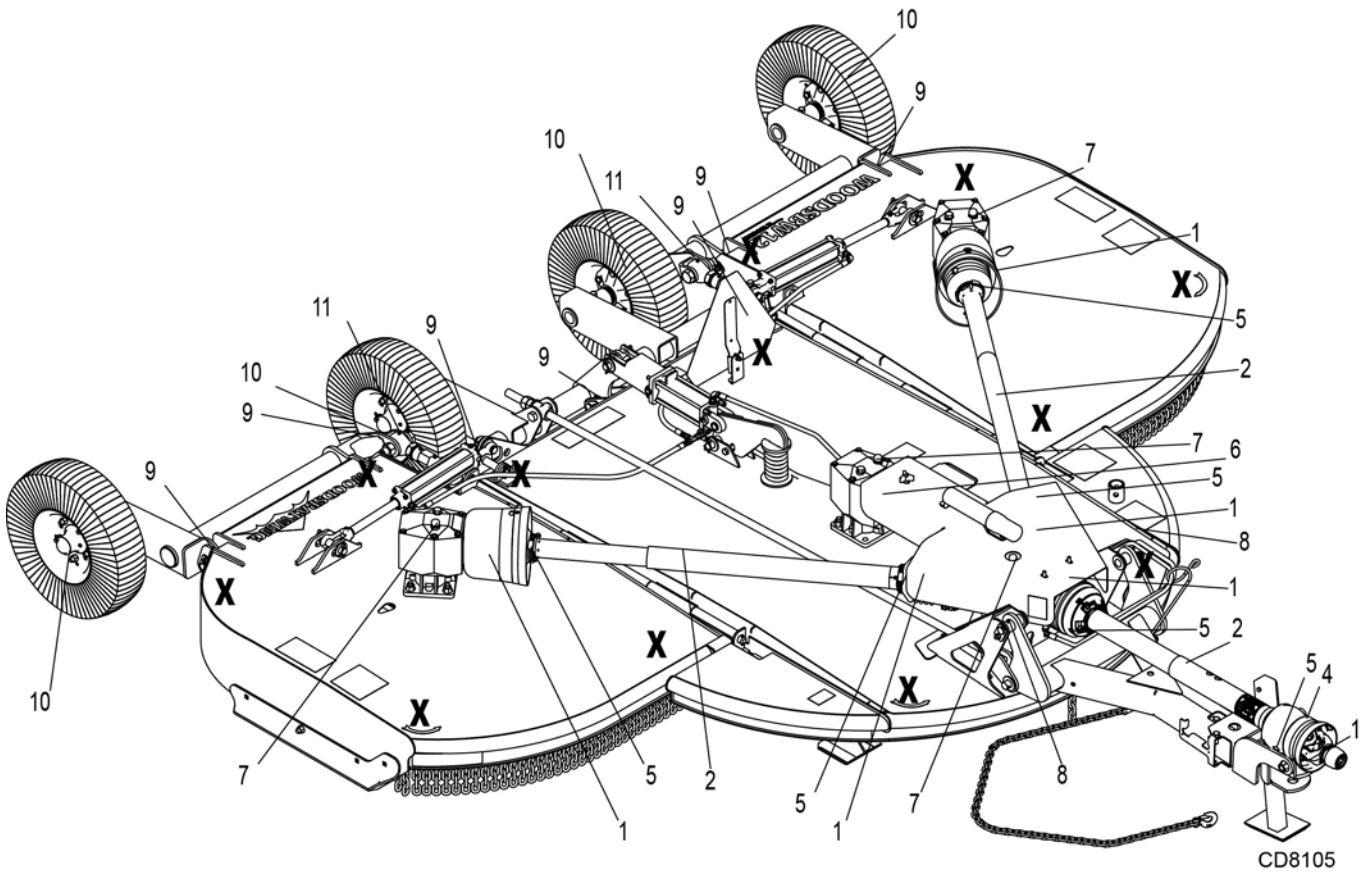
2. Consider the overall stability of the blocked unit. Just placing jackstands underneath will not ensure your safety.

   The working surface must be level and solid to support the weight on the jackstands. Make sure jackstands are stable, both top and bottom. Make sure cutter is approximately level.

3. With full cutter weight lowered onto jackstands, test blocking stability before working underneath.

4. If cutter is attached to tractor when blocking, set the brakes, remove key, and block cutter before working underneath.

5. Securely block rear tractor wheels, in front and behind.




| | | | |
|---|---|---|---|
| 1. Driveline U-joint | 10 Hours | 7. Gearbox | Daily |
| 2. Telescoping shaft | 10 Hours | 8. Tongue pivot | 40 Hours |
| 4. CV body assembly (10 pumps minimum) | 10 Hours | 9. Wheel yoke pivot | 40 Hours |
| | | 10. Tailwheel spindle | 20 Hours |
| 5. Driveline shield | 10 Hours | 11. Turnbuckle | 40 Hours |
| 6. Splined yoke | 10 Hours | | |

**Figure 5**. Jackstand Placement and Lubrication Points

## LUBRICATION

Do not let excess grease collect on or around parts, particularly when operating in sandy areas.

See Figure 5 for lubrication points and frequency for lubrication based on normal operating conditions. Severe or unusual conditions may require more frequent lubrication.

Use a lithium grease of #2 consistency with a MOLY (molybdenum disulfide) additive for all locations unless otherwise noted. Be sure to clean fittings thoroughly before attaching grease gun. One good pump of most guns is sufficient when the lubrication schedule is followed.

### Gearbox Lubrication

For gearbox, use a high quality gear oil with a viscosity index of 80W or 90W and an API service rating of GL–4 or –5 in gearboxes. Fill gearbox until oil runs out the side plug on gearbox. Check gearbox daily for evidence of leakage, and contact your dealer if leakage occurs. Use sealant on vent plug threads during installation. Check vent plug periodically and clean if it does not relieve pressure.

### Driveline Lubrication

1. Lubricate the driveline slip joint every eight operating hours. Failure to maintain proper lubrication could result in damage to U-joints, gearbox, and driveline.
2. Lower cutter to ground, disconnect driveline from tractor PTO shaft, and slide halves apart but do not disconnect from each other.
3. Apply a bead of grease completely around male half where it meets female half. Slide drive halves over each other several times to distribute grease.

## Seasonal Lubrication

In addition to the daily recommended lubrication, a more extensive application is recommended seasonally.

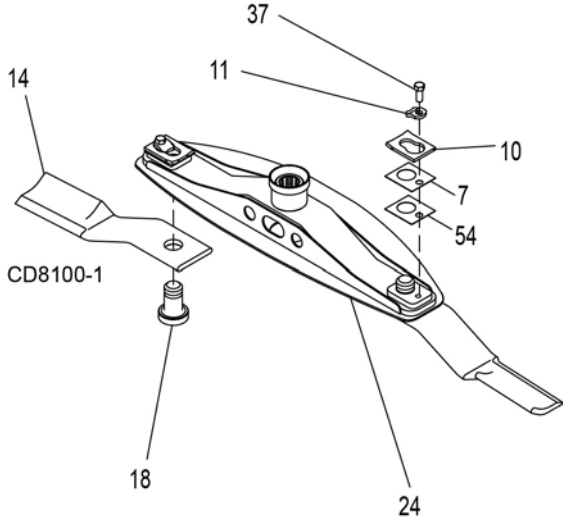
1. Fill CV double yokes with 20 pumps of grease with the joints in a straight line.
2. Articulate CV body to maximum angle several times to ensure full coverage of joints.
3. Place joints in the straight position and add 10 additional pumps of grease to both joints.
4. Wipe telescoping drive clean of all old grease and contaminants.
5. Add a thin layer of new grease over telescoping drive.

## BLADES

**⚠ WARNING**

■ **Before working underneath, read manual instructions, securely block up, and check stability. Secure blocking prevents equipment from dropping due to hydraulic leak down, hydraulic system failure, or mechanical component failure.**

### Blade Removal (Figure 6)




7. Shim, 20 ga
10. Keyhole plate
11. Blade lock clip
14. Blade
18. Blade pin
24. Crossbar
37. 1/2NC x 1-1/4 HHCS GR5 ZP
54. Shim, 18 ga

**Figure 6**. Blade Assembly

1. Disconnect driveline from tractor PTO.
2. Raise cutter and block securely (see Figure 5).
3. Align crossbar (24) with blade access hole in the cutter frame. Remove cap screw (37), blade pin lock clip (11), keyhole plate (10), and shims (7). Carefully drive blade pin (18) out of crossbar.
4. Rotate crossbar and repeat for opposite blade.

***NOTICE***

■ **If blade pin (18) is seized in crossbar and extreme force will be needed to remove it, support crossbar from below to prevent gearbox damage.**

### Blade Installation (Figure 6)

**⚠ CAUTION**

■ **Your dealer can supply genuine replacement blades. Substitute blades may not meet original equipment specifications and may be dangerous.**

***NOTICE***

■ **Crossbar rotation has clockwise rotation on left gearbox and counterclockwise rotation on the right and center gearboxes when looking down on cutter. Be sure to install blade cutting edge to lead in correct rotation.**

**NOTE:** Always replace or sharpen both blades at the same time.

1. Inspect blade pin (18) for nicks or gouges, and if you find any replace the blade pin. Lube with Anti-seize lubricant before installing.
2. Insert blade pin through the blade. Blade should swivel on blade pin; if it doesn't, determine the cause and correct.
3. Align crossbar (24) with blade access hole in cutter frame. Apply a liberal coating of Never-Seez® or equivalent to blade pin and crossbar hole. Make sure blade offset is down away from cutter.
4. Insert blade pin (18) through blade. Push blade pin through crossbar.
5. Install shims (7) over blade pin.

   **NOTE:** Only use enough shims to allow keyhole plate (10) to slide into blade pin groove.
6. Install blade clip (11) over keyhole plate and into blade pin groove.
7. Secure into position with cap screw (37). Torque cap screw to 85 lbs-ft.
8. Repeat steps for opposite side.

   **NOTE:** Blade should be snug but should swivel on pin without having to exert excessive force. Blade should not move more than a 1/4 inch up or down at the tip. Keep any spacers not used in the installation as replacements or for future installation.

## Blade Sharpening

### *NOTICE*

■ **When sharpening blades, grind the same amount on each blade to maintain balance. Replace blades in pairs. Unbalanced blades will cause excessive vibration, which can damage gearbox bearings. Vibration may also cause structural cracks to cutter.**

1. Sharpen both blades at the same time to maintain balance. Follow original sharpening pattern.
2. Do not sharpen blade to a razor edge—leave at least a 1/16" blunt edge.
3. Do not sharpen back side of blade.

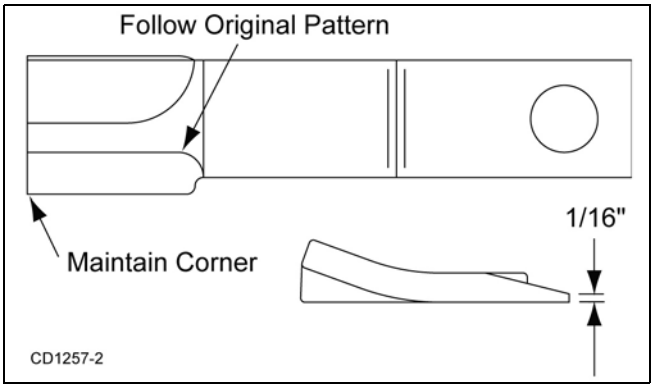


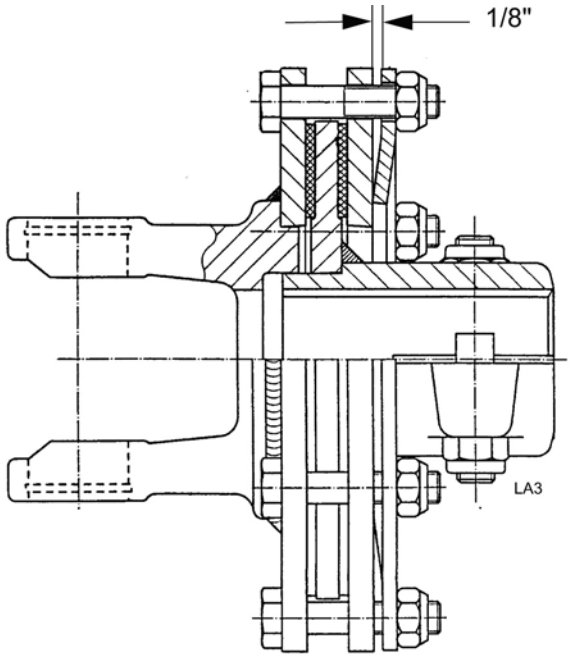

**Figure 7**. Blade Sharpening

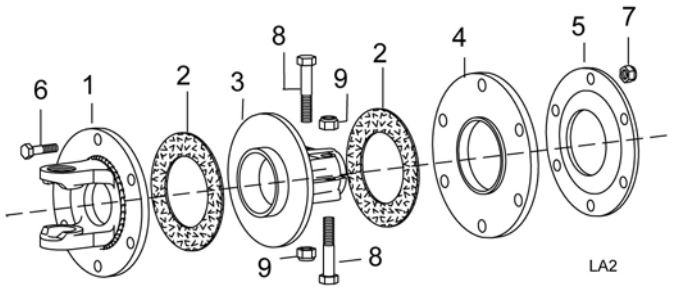
## SLIP CLUTCH ADJUSTMENT (FIGURE 8)

The slip clutch is designed to slip so that the gearbox and driveline are protected if the cutter strikes an obstruction.

A new slip clutch or one that has been in storage over the winter may seize. Before operating the cutter, make sure it will slip by performing the following operation:

1. Turn off tractor engine and remove key.
2. Remove driveline from tractor PTO.
3. Loosen six 10 mm cap screws (6) to remove all tension from Belleville spring plate (5).
4. Hold clutch hub (3) solid and turn shaft to make sure clutch slips.
5. If clutch does not slip freely, disassemble and clean the thrust plate faces (4), flange yoke (1), and clutch hub (3).
6. Reassemble clutch.
7. Tighten Belleville spring (5) until it is against the thrust plate (4) of the clutch, and then back off each of the six nuts by 2 full revolutions. The gap between Belleville spring and thrust plate should be 1/8" as shown in Figure 8.
8. If a clutch continues to slip when the spring is compressed to 1/8" gap, check friction discs (2) for excessive wear. Discs are 1/8" when new. Replace discs after 1/16" wear. Minimum disc thickness is 1/16".




1. Flange yoke
2. Friction disc
3. Hub 1-3/8 round bore
4. Thrust plate
5. Belleville spring plate
6. 10 mm x 1.5P x 50 mm Cap screw
7. 10 mm x 1.5P Hex nut
8. 12 mm x 1.5P x 65 mm Cap screw
9. 12 mm x 1.5P Hex nut

**Figure 8**. Slip Clutch Assembly

## SHIELDING REPAIR

**⚠ DANGER**

**■ Full chain shielding must be installed at all times. Thrown objects could injure people or damage property.**

- **If the machine is not equipped with full chain shielding, operation must be stopped.**
- **This shielding is designed to reduce the risk of thrown objects. The mower deck and protective devices cannot prevent all objects from escaping the blade enclosure in every mowing condition. It is possible for objects to ricochet and escape, traveling as much as 300 feet (92m).**

**Repairing Chain Shielding:**

1. Inspect chain shielding each day of operation and replace any broken or missing chains as required.
2. Replace any missing hardware.

## SERVICING TIRES SAFELY

**Used Aircraft Tires (Figure 9)**

**⚠ WARNING**

■ Explosive separation of tire and rim parts can cause serious injury or death. Release all air pressure before loosening bolts.

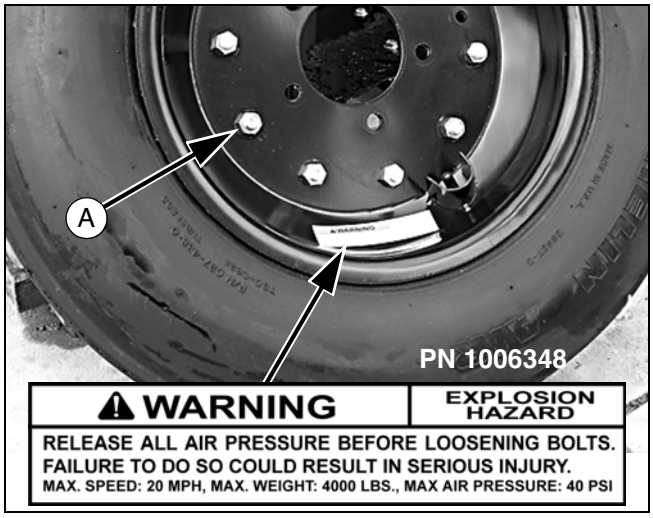
Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job.

Always maintain the correct tire pressure. Do not inflate tires above the recommended pressure. Never weld or heat a wheel and tire assembly. The heat can cause an increase in air pressure and result in a tire explosion. Welding can structurally weaken or deform the wheel.

When inflating tires, use a clip-on chuck and an extension hose long enough to allow you to stand to the side — not in front of or over the tire assembly. Use a safety cage if available.

Check wheels for low pressure, cuts, bubbles, damaged rims, or missing lug bolts and nuts.

Never remove split rim assembly hardware (A) with the tire inflated.


A
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WARNING
EXPLOSION HAZARD
RELEASE ALL AIR PRESSURE BEFORE LOOSENING BOLTS.
FAILURE TO DO SO COULD RESULT IN SERIOUS INJURY.
MAX. SPEED: 20 MPH, MAX. WEIGHT: 4000 LBS., MAX AIR PRESSURE: 40 PSI

**Figure 9**. Split Rim Tire Servicing

## CLEANING

**After Each Use**

- Remove large debris such as clumps of dirt, grass, crop residue, etc. from machine.
- Inspect machine and replace worn or damaged parts.
- Replace any safety decals that are missing or not readable.

**Periodically or Before Extended Storage**

- Clean large debris such as clumps of dirt, grass, crop residue, etc. from machine.
- Remove the remainder using a low-pressure water spray.
  1. Be careful when spraying near scratched or torn safety decals or near edges of decals as water spray can peel decal off surface.
  2. Be careful when spraying near chipped or scratched paint as water spray can lift paint.
  3. If a pressure washer is used, follow the advice of the pressure washer manufacturer.
- Inspect machine and replace worn or damaged parts.
- Sand down scratches and the edges of areas of missing paint and coat with Woods spray paint of matching color (purchase from your Woods dealer).
- Replace any safety decals that are missing or not readable (supplied free by your Woods dealer). See Safety Decals section for location drawing.

# TROUBLESHOOTING

| PROBLEM | POSSIBLE CAUSE | SOLUTION |
|---|---|---|
| Does not cut | Dull blades | Sharpen blades. |
| | Worn or broken blades | Replace blades. (Replace in pairs only.) |
| | Incorrect PTO speed | Set at rated PTO speed. |
| | Ground speed too fast | Reduce ground speed. |
| | Drive not functioning (blades do not turn when PTO is running) | Check drive shaft connection. Check gearbox. |
| | Gearbox malfunction | Repair gearbox. |
| | Excessive clutch slippage | Adjust clutch. |
| | Incorrect blade direction | Check to be sure blade edge is correct for direction of rotation. |
| Streaks or ragged cut | Broken or worn blades | Replace or sharpen blades. |
| | Attitude incorrect | Level machine. |
| | Ground speed too fast | Reduce ground speed. |
| | Excessive cutting height | Lower cutting height. (Note: Set height so blades do not hit ground.) |
| | Excessive lush and tall vegetation | Recut at 90° to first pass. |
| Excessive side skid wear | Running with skids continuously on ground | Raise cutting height or adjust. |
| Excessive clutch slippage | Clutch out of adjustment | Adjust clutch. |
| | Clutch discs worn; wear stops contacting opposite plate | Replace discs. |
| | Blades hitting ground | Raise cutting height. |
| Vibration | Broken blade | Replace blades in pairs. |
| | Bearing failure | Check gearbox shafts for side play. |
| | Hitch length incorrect | Reset hitch length. |
| | Universal drive | Adjust pedestal bearing height to be parallel to ground. |
| Blades hitting deck | Bent blades or crossbar | Replace bent blades or crossbar. |
| Unit will not raise | Low oil | Add hydraulic oil. |
| Unit doesn't cut level | Wing section cuts lower than center | Lengthen turnbuckle connecting center yoke to wing wheel yoke. |
| | Wing section cuts higher than center | Shorten turnbuckle connecting center yoke to wing wheel yoke. |

The information in this section is written for dealer service personnel. The repair described here requires special skills and tools. If your shop is not properly equipped or your mechanics are not properly trained in this type of repair, you may be time and money ahead to replace complete assemblies.

**⚠ WARNING**

■ **Before working underneath, read manual instructions, securely block up, and check stability. Secure blocking prevents equipment from dropping due to hydraulic leak down, hydraulic system failure, or mechanical component failure.**

■ **Keep all persons away from operator control area while performing adjustments, service, or maintenance.**

**⚠ CAUTION**

■ **Always wear relatively tight and belted clothing to avoid getting caught in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head; and respirator or filter mask where appropriate.**

## GEARBOX MAINTENANCE

**NOTE:** Read this entire section before starting any repair. Many steps are dependent on each other.

1. Fill gearbox with SAE 80W or 90W gear lube. Proper oil level is between lowest ring and end of dipstick.

   **NOTE:** Repair to this gearbox is limited to replacing bearings, seals, and gaskets. Replacing gears, shafts, and a housing is not cost effective. Purchasing a complete gearbox is more economical.

2. Inspect gearbox for leakage and bad bearings. Leakage is a very serious problem and must be corrected immediately.

   **NOTE:** Bearing failure is indicated by excessive noise and side-to-side or end-play in gear shafts.

### Seal Replacement (Figure 12)

Recommended sealant for gearbox repair is Permatex® Aviation 3D Form-A-Gasket or equivalent.

Leakage can occur at the vertical or horizontal gaskets and shaft seals.

Leakage at the horizontal gasket or seal can be repaired without removing the gearbox from the cutter.

#### Seal Installation

**NOTE:** Proper seal installation is important. An improperly installed seal will leak.

1. Clean area in housing where seal outer diameter (OD) seats. Apply a thin coat of Permatex.
2. Inspect area of shaft where seal seats. Remove any burrs or nicks with an emery cloth.
3. Lubricate gear shaft and seal lips.
4. Place seal squarely on housing, spring-loaded lip toward housing. Select a piece of pipe or tubing with an OD that will sit on the outside edge of the seal but will clear the housing. Tubing with an OD that is too small will bow seal cage and ruin seal.
5. Carefully press seal into housing, avoiding distortion to the metal seal cage.

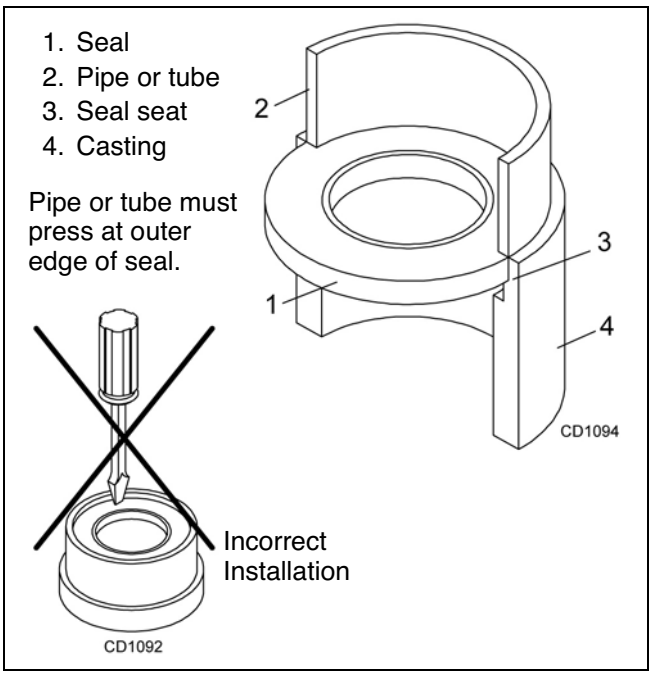



**Figure 12**. Seal Installation

## SEAL REPAIR

### Vertical Shaft Seal Repair

1. Disconnect and remove the rear driveline from the gearbox.
2. Remove vent plug (9) and siphon gear lube from housing through this opening.
3. Remove crossbar (see **Crossbar Removal, page 30**).
4. Remove output cap (17) and output seal (16) by removing four cap screws (13) and washers (12). Replace with new seal (see **Seal Installation, page 25**).

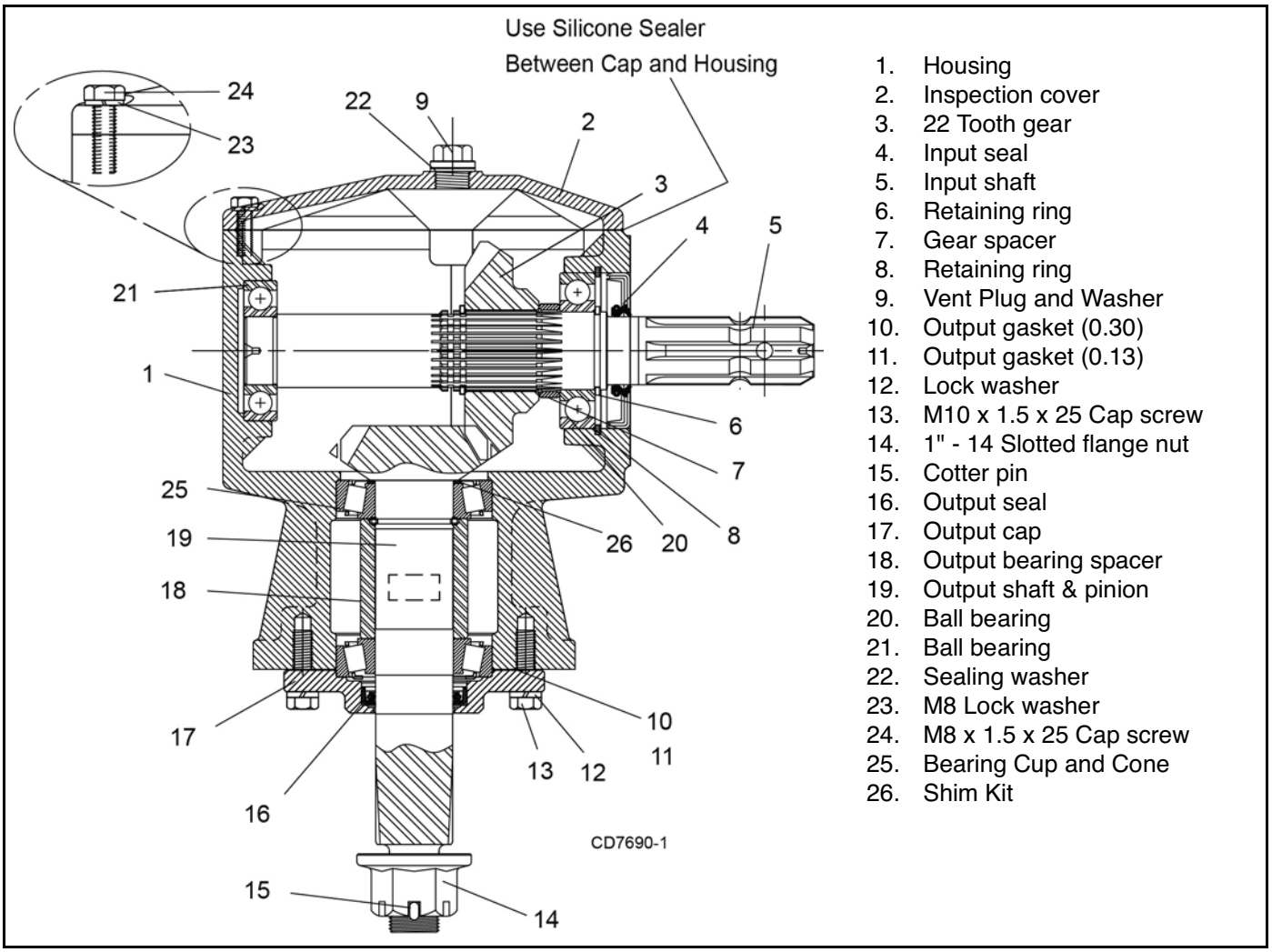
   Vertical seal should be recessed in output cap.

   **NOTE:** Distortion to seal cage or damage to seal lip will cause seal to leak.
5. Secure output cap (17) on to bottom of gearbox using four cap screws (13) and lock washers (12).

   **NOTE:** Make sure output gasket (10) and (11) are in place.
6. Fill gearbox with SAE 80W or 90W gear lube until it runs out the side level plug.
7. Remove and replace any seal damaged in installation.

### Horizontal Seal Leak Repair

1. Disconnect and remove the rear driveline from the gearbox.
2. Remove vent plug (9) and siphon gear lube from housing through this opening.
3. Remove input seal (4). Replace with new one (refer to **Seal Installation, page 25**).
4. Fill gearbox with SAE 80W or 90W gear lube until it runs out the side level plug.




1. Housing
2. Inspection cover
3. 22 Tooth gear
4. Input seal
5. Input shaft
6. Retaining ring
7. Gear spacer
8. Retaining ring
9. Vent Plug and Washer
10. Output gasket (0.30)
11. Output gasket (0.13)
12. Lock washer
13. M10 x 1.5 x 25 Cap screw
14. 1" - 14 Slotted flange nut
15. Cotter pin
16. Output seal
17. Output cap
18. Output bearing spacer
19. Output shaft & pinion
20. Ball bearing
21. Ball bearing
22. Sealing washer
23. M8 Lock washer
24. M8 x 1.5 x 25 Cap screw
25. Bearing Cup and Cone
26. Shim Kit

**Figure 13**. Cast/Crown Top Gearbox Assembly

## GEARBOX REPAIR

**(Figure 13)**

**NOTE:** Repair to this gearbox is limited to replacing bearings, seals, and gaskets. Replacing gears, shafts, and a housing is not cost effective. Purchasing a complete gearbox is more economical.

Gearbox is heavy: do not attempt to move without mechanical assistance.)

### Remove Gearbox from Cutter

1. Disconnect and remove the rear driveline from the gearbox.
2. Remove vent plug (9) and siphon gear lube from housing through this opening.
3. Remove cotter pin or wire, washer, and nut from vertical shaft and remove crossbar (see **Crossbar Removal, page 30**).
4. Remove the four bolts that attach gearbox to cutter and remove gearbox.

### Disassemble Gearbox

1. Remove plug from side of gearbox and pour out remaining gear oil.
2. Support housing in vise in a vertical position.
3. Remove input seal (4) (to be replaced).
4. Remove retaining rings (6) and (8).
5. Remove the six cap screws (24), washers (23) and top cover (2) from housing.
6. Remove retaining ring (6) behind gear (3).
7. Support gearbox in hand press and pull input shaft (5) through gear (3). Remove ball bearing (21).
8. Remove ball bearing (20) and gear spacer (7) from input shaft (5).
9. Support housing in vise in a horizontal position.
10. With the hub/stump jumper/crossbar, castle nut, cotter pin, wire and washer already removed, remove the four cap screws (13), lock washers (12) and output cap (17).
11. Remove output gaskets (11) and (10).
12. Push output shaft and pinion (19) down and remove tapered roller bearings (25), output bearing spacer (18), and retaining ring (6). Remove output shaft and pinion (19).

    **NOTE:** On gearboxes with tapered roller bearings, it will be necessary to use a punch to drive out bearing cups.

13. Inspect gears for broken teeth and wear. Some wear is normal and will show on loaded side. Forged gear surfaces are rough when new. Check that wear pattern is smooth.
14. Inspect vertical and horizontal shafts for grooves, nicks, or bumps in the areas where the seals seat. Resurface any damage with emery cloth.
15. Inspect housing and caps for cracks or other damage.

### Reassemble Gearbox

1. Clean housing, paying specific attention to areas where gaskets will be installed.
2. Wash housing and all components thoroughly. Select a clean area for gearbox assembly. Replace all seals, bearings, and gaskets. All parts must be clean and lightly oiled before reassembling.
3. Insert upper output bearing cups (25) in the housing and press using a round tube with the correct diameter.
4. Slide shims (26) over output shaft (16). Use the same thickness as removed as a starting point.
5. Push bearing cone (25) onto output shaft (16). Shims maybe required between cone (25) and retaining ring (6) to eliminate any space.

    **NOTE:** Make sure there is no endplay or gaps in this assembly.

6. Insert output bearing spacer (18) and bearing cone (25) over output shaft until seats against upper bearing (25). Press lower bearing cup into position as shown.
7. Secure output cap (17) with new output seal (16) installed to bottom of gearbox housing using the four 10mm x 1.5 x 25 cap screws (13) and lock washers (12). Use shim gaskets (10) and (11) to adjust output bearings to a rolling torque of 9 to 12 In-lbs.

    **NOTE:** Be sure output gaskets (10 and 11) are in place. Apply grease to output seal (16) lip for easy installation.

8. Place ball bearing (21) at back of housing and press in socket using a round tube of the correct diameter and a hand press until fully seated.
9. Insert input shaft (5) part way through housing and slide gear (3) and retaining ring (6) over input shaft (5). Keep gear (3) and retaining ring (6) loose.
10. Insert input shaft (5) into roller bearing (21) until seated against each other.
11. Slide gear (3) forward and attach retaining ring (6) in groove closest to front of input shaft (5). Slide gear (3) back against retaining ring (6).

12. Check that the gear backlash is between 0.006" and 0.016". You should not have to adjust the backlash.
13. Slide gear spacer (7) and ball bearing (20) on input shaft (5) and secure with retaining rings (6) and (8).
14. Slide input seal (4) onto input shaft (5) and press into housing flush with front using a tube of correct diameter. Be careful not to damage seal lip.
15. Check gearbox housing for leaks by plugging all holes except one. Apply 4 psi compressed air and immerse the gearbox in water to verify that there are no leaks.

Remove gearbox from water and dry off with compressed air. Add SAE 80W or 90W EP oil until it runs out of side level hole. Tighten all plugs.

## SPLITTER GEARBOX REPAIR (Figure 14)

### Removal from Cutter

1. Disconnect and remove all drivelines from gearbox.
2. Remove the four cap screw and lock nuts that secure gearbox to cutter, and remove gearbox.

   **NOTE:** Gearbox is heavy: do not attempt to move it without mechanical assistance.

### Disassembly

#### Center Shaft

1. Remove plug from side of gearbox and pour out the gear oil.
2. Remove seal (11, to be replaced) from the front and rear of the center shaft (14).
3. Remove snap ring (10) and shim (12) from the front and rear of the center shaft (14).
4. Support gearbox in a hand press and push on the rear of the center shaft.
5. Remove bearing (13) from center shaft (14).
6. Remove six cap screws (20) and top cover (21) from the gearbox housing.
7. Remove gear (17) and bearing (16).
8. Snap ring (15) does not have to be removed from shaft (14) unless it is damaged.

#### Side Shaft

9. Remove seal (2), (to be replaced) from the output shaft (1).
10. Remove snap ring (4) and shim (8) from output shaft (1).
11. Support gearbox in hand press. Using a punch through the front opening of the gearbox and, push shaft (1) and bearing (5) out the backside of housing.
12. Remove gear (6) from inside housing.
13. Remove bearing (7) and shim (8) by using a hammer and punch through front opening of the gearbox and force them out the backside of the housing.
14. Repeat steps 7 through 11 for opposite side shaft.

#### Inspect Components

15. Inspect gears for broken teeth and wear. Some wear is normal and will show on the loaded side of the teeth. Forged gear surfaces are rough when new. Check that wear pattern is smooth.
16. Inspect shafts for grooves, nicks, or bumps in the areas where seals seat. Resurface any damage with emery cloth or replace shaft.
17. Inspect housing and caps for cracks or other damage.

### Assembly

1. Clean housing, pay specific attention to areas where gaskets are installed.
2. Wash housing and all components thoroughly.
3. Select a clean work area to assemble gearbox.
4. Replace all seals, bearings, and gaskets.
5. All parts must be clean and lightly oiled before assembly.

#### Side Shaft

6. Insert bearing (7) and shim (8) in housing using a round tube of the same size diameter and a hand press.
7. Place gear (6) inside the housing and slide output shaft (1) through gear (6) and into bearing (7).
8. Slide bearing (5) and shim (8) over output shaft. Secure with snap ring (4).
9. Check end play of shaft by moving it in and out. If end play is more than 0.012", insert another shim (8) between snap ring and bearing. Repeat process until end play is less than 0.012".
10. Check rotational torque. Torque should be less than 2.2 lbs-inch gear.
11. Place seal (2) over shaft and press into housing using a tube of the same diameter. Seal should be flush with housing when properly installed.
12. Repeat steps 6 through 10 for opposite side shaft.

#### Center Shaft

13. Place gear (17) inside housing and slide center shaft (14) through the gear from the front of the housing.

14. Slide bearings (16 & 13) and shims (12) over each end of the center shaft (14). Secure bearings into position using snap rings (10).

15. Check end play of shaft by moving it in and out. If end play is more than 0.012", insert another shim (12) between snap ring and bearing. Repeat process until end play is less than 0.012".

16. Check rotational torque. Torque should be less than 2.2 lbs-inch gear.

17. Check gear backlash, backlash should be between 0.006" and 0.016". You should not have to adjust for backlash.

18. Place seal (11) over shaft and press into housing using a tube of the same diameter. Seal should be flush with housing when properly installed. Repeat process for opposite end shaft.

## Check Gearbox

1. Place top cover (21) on housing and secure into position using six cap screws (20).

2. Check gearbox for leaks by: plugging all holes except one, applying 4 psi of compressed air, and immersing gearbox in water. Verify gearbox does not leak.

   **NOTE:** Excessive air pressure will damage seals.

3. Remove gearbox from water and dry off.

4. Remove upper plug (3) on right side of housing. Add SAE 80W or 90W EP oil until it runs out side level hole. Replace plug.

5. Install breather (18) in top cover.

## Reinstallation on Cutter

**NOTE:** Gearbox is heavy: do not attempt to move it without mechanical assistance.

1. Place gearbox on cutter and secure into position using four cap screws and lock washers.

2. Torque hardware to 300 lbs-ft.

3. Attach all drivelines to gearbox.

4. Install all shields.

1. Shaft 1-3/4, 20 spline, wing
2. Oil seal
3. 3/8 plug
4. Snap ring
5. Bearing
6. Pinion gear
7. Bearing
8. Shim
9. Housing
10. Snap ring
11. Oil seal
12. Shim
13. Bearing
14. Shaft 1-3/4, 20 spline, center
15. Snap ring
16. Bearing
17. Gear
18. 1/2 Breather
19. 5/16 Lock washer
20. M8 x 30 Cap screw 8.8
21. Cover
22. Snap ring

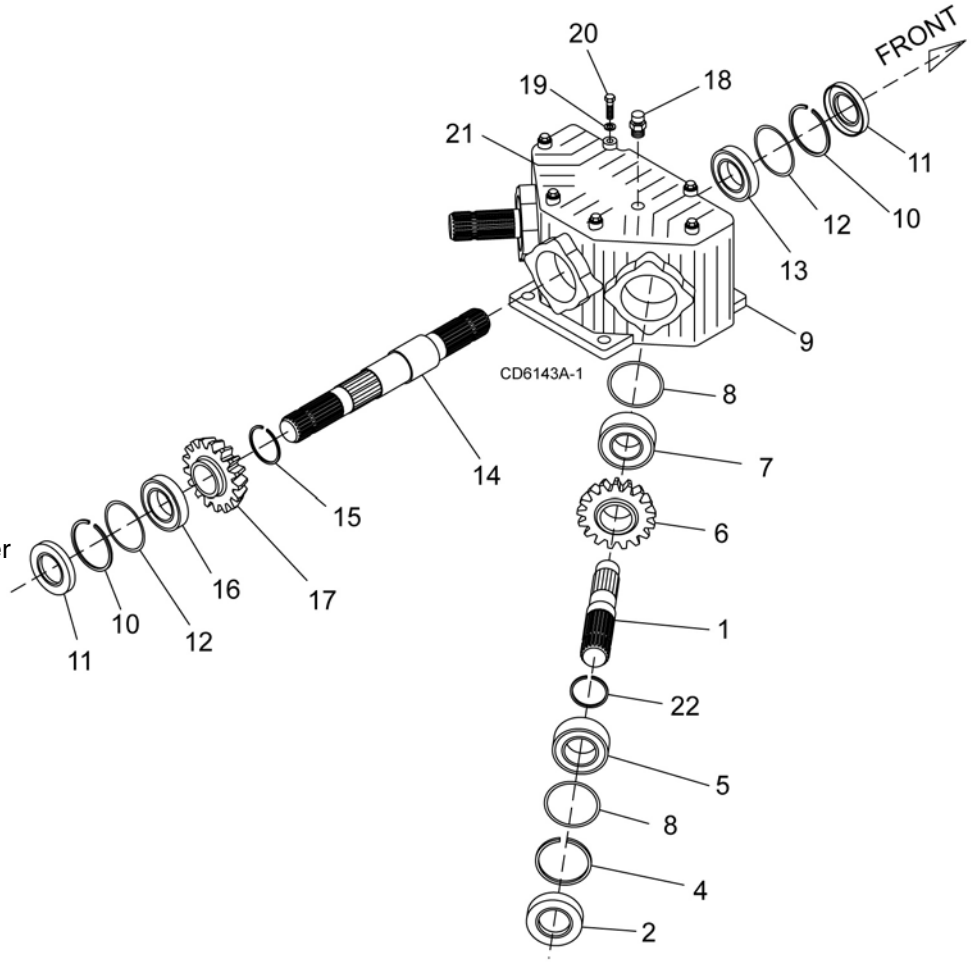



**Figure 14**. Splitter Gearbox Assembly

## CROSSBAR REMOVAL

1. It is necessary to gain access to bottom side of cutter for crossbar removal. See Blocking Method page 19.

   **NOTE:** You will need to use either the puller screw (Item 6, ) or a small hydraulic jack to remove the crossbar.

2. Refer to blade removal on page 21. Figure 6.

3. Refer to . Remove cotter pin from bottom of crossbar and remove nut and washer.

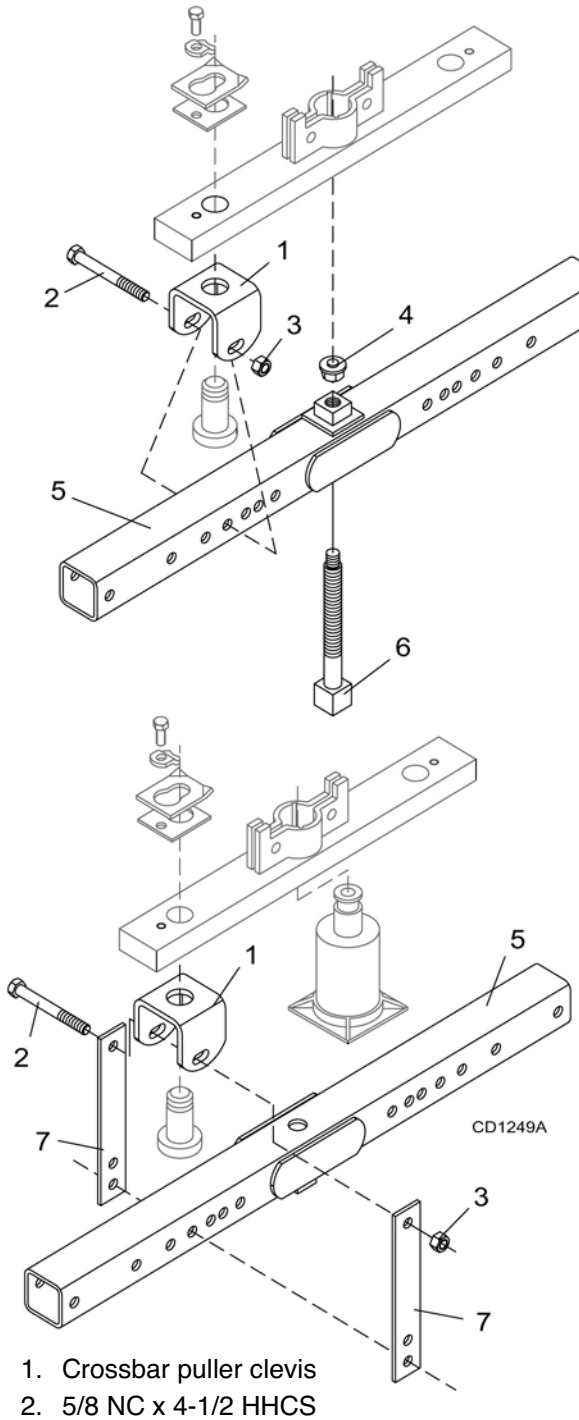
4. Attach a clevis (1) to each end of crossbar, using blade pins, spacers, keyhole plates, and blade pin clips.

5. Position tube assembly (5) with threaded nut (4) toward crossbar for puller screw removal or down for hydraulic jack removal.

6. For removal with puller screw, attach tube (5) to each clevis with bolts (2) and nuts (3). Place pad (4) in nut and thread puller screw (6) into nut from bottom. Tighten until pad is solid against gearbox shaft. For best results, strike head of puller screw with a hammer while tightening with a wrench.

7. For removal with a jack, attach tube to each clevis with puller links (7), bolts (2), and nuts (3). Place jack on tube with end of jack pressing against gearbox shaft. Slowly apply force with jack.

   **NOTE:** Hydraulic jack will not operate if tipped more than 90°. Use care to prevent bending crossbar during removal.




1. Crossbar puller clevis
2. 5/8 NC x 4-1/2 HHCS
3. 5/8 NC Hex nut
4. Crossbar puller pad
5. Crossbar puller tube
6. Crossbar puller screw
7. Crossbar puller link

**Figure 15**Crossbar Removal

## CROSSBAR INSTALLATION

1. Using emery cloth (220 or finer), remove surface rust, Loctite® and foreign material from hub, splined gearbox vertical shaft, and crossbar assembly.
2. Slide crossbar assembly (24) onto splined shaft. Install nut and align a slot with hole in splined shaft. Torque nut to 450 lbs-ft.
3. Install cotter pin (73) through slot in nut and bend ends over.
4. Install blades. Refer to blade installation on page 21.

## UNIVERSAL JOINT REPAIR

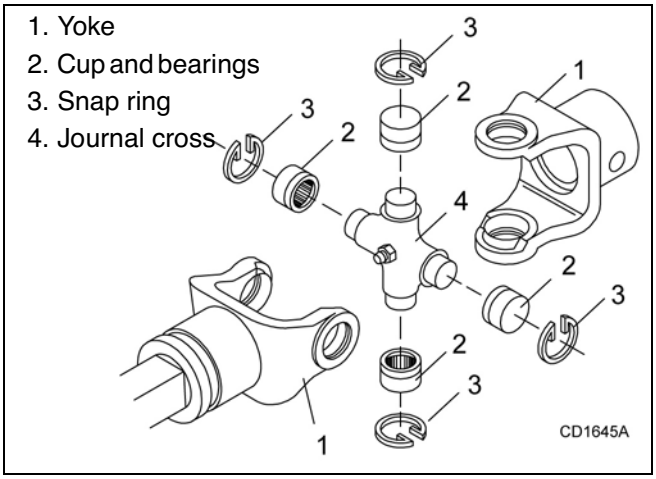



**Figure 16**. U-Joint Exploded View

### U-Joint Disassembly

1. Remove external snap rings from yokes in four locations as shown in Figure 17.

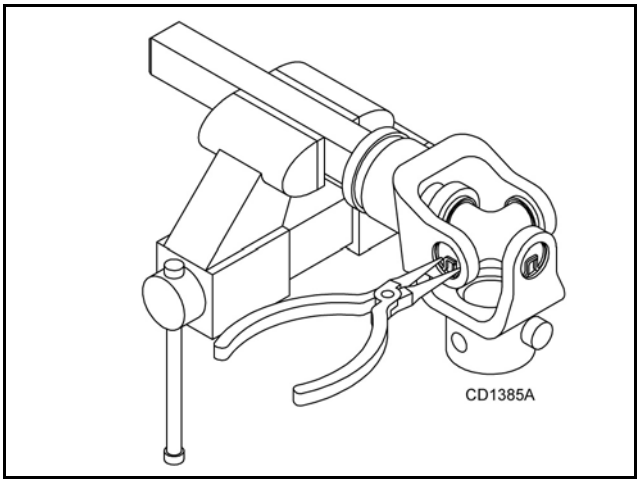



**Figure 17**

2. With snap rings removed, support drive in vise, hold yoke in hand and tap on yoke to drive cup up out of yoke. See Figure 18.

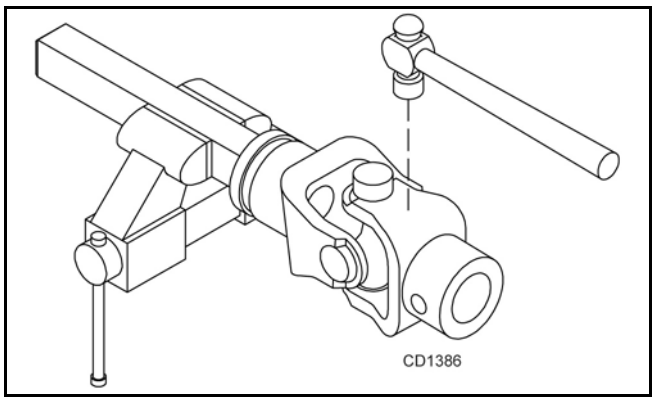



**Figure 18**

3. Clamp cup in vise as shown in Figure 19 and tap on yoke to completely remove cup from yoke. Repeat step 2 and step 3 for opposite cup.

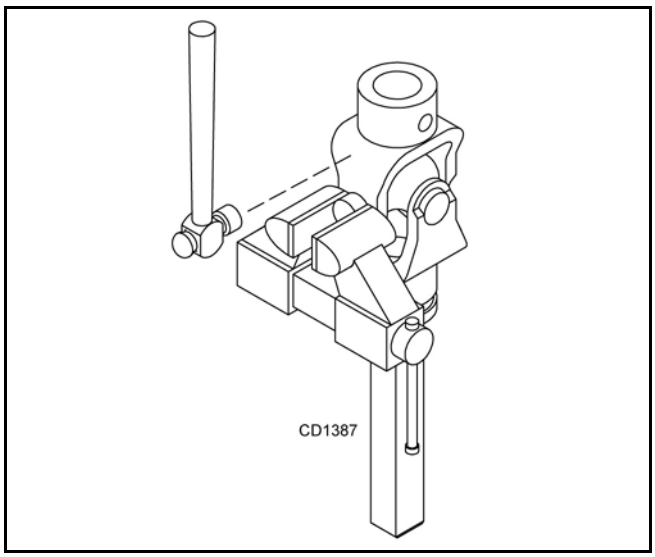



**Figure 19**

4. Place universal cross in vise as shown in Figure 20 and tap on yoke to remove cup. Repeat Step 3 for final removal. Drive remaining cup out with a drift and hammer.

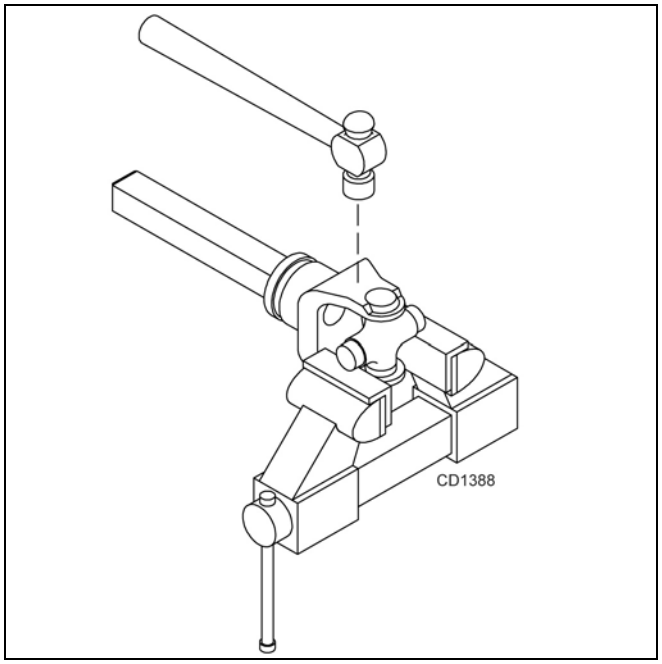



**Figure 20**

## U-Joint Assembly

1. Place seals securely on bearing cups. Insert cup into yoke from outside and press in with hand pressure as far as possible. Insert journal cross into bearing cup with grease fitting away from shaft. Be careful not to disturb needle bearings. Insert another bearing cup directly across from first cup and press in as far as possible with hand pressure.
2. Trap cups in vise and apply pressure. Be sure journal cross is started into bearings and continue pressure with vise, squeezing in as far as possible. Tapping the yoke will help.
3. Seat cups by placing a drift or socket (slightly smaller than the cup) on cup and rap with a hammer. Install snap ring and repeat on opposite cup.
4. Repeat Step 1 and Step 2 to install remaining cups in remaining yoke.
5. Move both yokes in all directions to check for free movement. If movement is restricted, rap on yokes sharply with a hammer to relieve any tension. Repeat until both yokes move in all directions without restriction.

## SERVICING TIRES SAFELY

**Used Aircraft Tires (Figure 21)**

**⚠ WARNING**

■ **Explosive separation of tire and rim parts can cause serious injury or death. Release all air pressure before loosening bolts.**

Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job.

Always maintain the correct tire pressure. Do not inflate tires above the recommended pressure. Never weld or heat a wheel and tire assembly. The heat can cause an increase in air pressure and result in a tire explosion. Welding can structurally weaken or deform the wheel.

When inflating tires, use a clip-on chuck and an extension hose long enough to allow you to stand to the side — not in front of or over the tire assembly. Use a safety cage if available.

Check wheels for low pressure, cuts, bubbles, damaged rims, or missing lug bolts and nuts.

Never remove split rim assembly hardware (A) with the tire inflated.

A
PN 1006348
WARNING
EXPLOSION HAZARD
RELEASE ALL AIR PRESSURE BEFORE LOOSENING BOLTS.
FAILURE TO DO SO COULD RESULT IN SERIOUS INJURY.
MAX. SPEED: 20 MPH, MAX. WEIGHT: 4000 LBS., MAX AIR PRESSURE: 40 PSI

**Figure 21**. Split Rim Tire Servicing

# ASSEMBLY INSTRUCTIONS

## DEALER SET-UP INSTRUCTIONS

Set-up of this cutter is the responsibility of the WOODS dealer. It should be delivered to the owner completely assembled, lubricated and adjusted for normal cutting conditions.

The cutter is shipped fully assembled. Recommended torque values for hardware are located on page 50.

Complete the check list on page 34 when assembly is complete and cutter is delivered to the customer.

**⚠ WARNING**

■ **Before working underneath, carefully read Operator's Manual instructions, disconnect driveline, raise mower, securely block up all corners with jackstands, and check stability. Secure blocking prevents equipment from dropping due to hydraulic leak down, hydraulic system failures, or mechanical component failures.**

■ **Do not disconnect hydraulic lines until machine is securely blocked or placed in lowest position and system pressure is released by operating valve levers.**

**⚠ CAUTION**

■ **Always wear relatively tight and belted clothing to avoid entanglement in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head; and respirator or filter mask where appropriate.**

This cutter is fully assembled and adjusted at the factory with a two hose hydraulic set-up. One hose operates cut height adjustment. One hose operates wing angle. For tractors with only one available hydraulic outlet, follow the instructions below to change unit over.

1. Remove hose (6) attached to bulkhead fitting (5) under height cylinder.
2. Remove the plug from side of cylinder.
3. Install adapter (3) found in manual tube into cylinder.
4. Remove tee (2) from bulkhead fitting (5).
5. Install tee (2) onto cylinder adapter (3) just installed.

Unit will now operate both height cylinders and wing cylinders off of one hose.

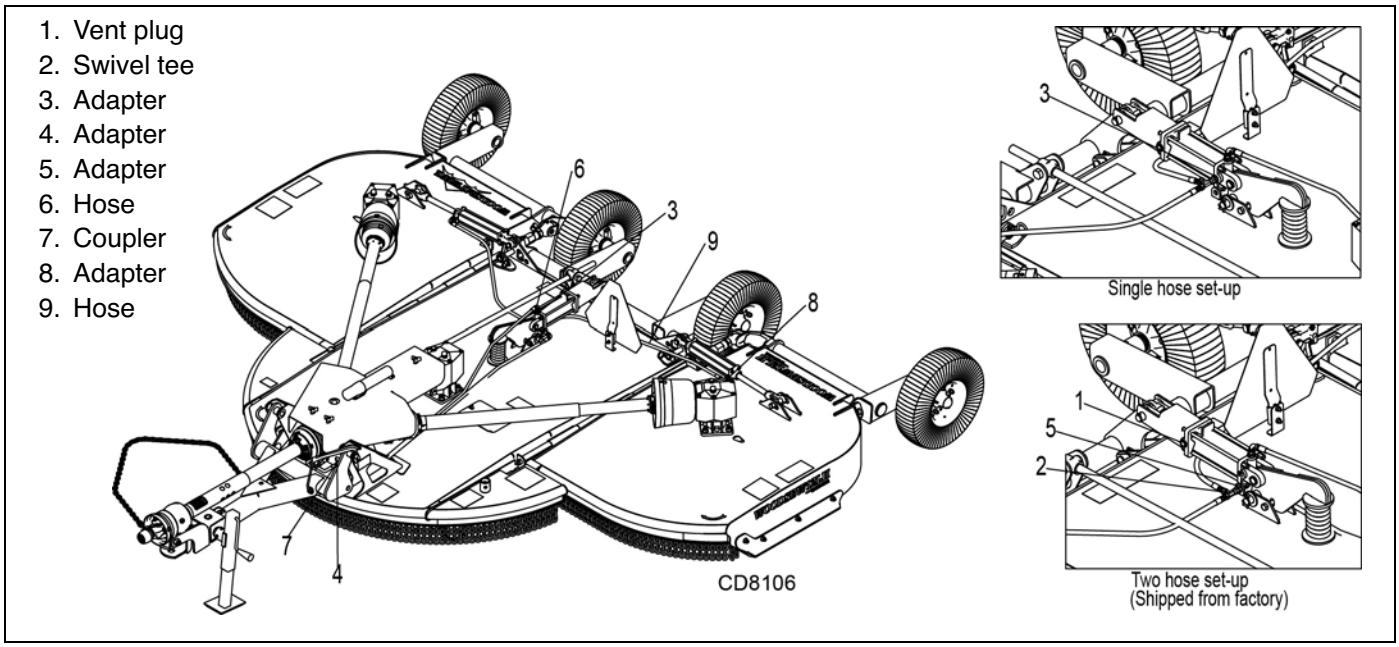



**Figure 22**. Hose Set-Up

# DEALER CHECK LISTS

## PRE-DELIVERY CHECK LIST

(DEALER'S RESPONSIBILITY)

Inspect the equipment thoroughly after assembly to ensure it is set up properly before delivering it to the customer.

The following check lists are a reminder of points to inspect. Check off each item as it is found satisfactory or after proper adjustment is made.

### *NOTICE*

■ **Gearboxes are filled at the factory. Prior to delivery, make sure each gearbox is filled with 80 or 90W API GL-4 or GL-5 gear lube to the side plug.**

___ Check that all safety decals are installed and in good condition. Replace if damaged.

___ Check that shields and guards are properly installed and in good condition. Replace if damaged.

___ Check all bolts to be sure they are properly torqued.

___ Check wheel bolts for proper torque.

___ Check that all cotter pins and safety pins are properly installed. Replace if damaged.

___ Check that blades have been properly installed.

___ Check and grease all lubrication points as identified in lubrication information on page 20.

___ Check the level of gearbox fluids before delivery. Service, if required, as specified in the lubrication information on page 20.

## DELIVERY CHECK LIST

(DEALER'S RESPONSIBILITY)

___ Show customer how to make adjustments and select proper PTO speed.

___ Show customer how to make sure driveline is properly installed and that spring-activated locking pin or collar slides freely and is seated in groove on tractor PTO shaft.

___ Show customer how to determine the turning limits of the CV PTO driveline.

___ Show customer the safe, proper procedures to be used when mounting, dismounting, and storing equipment.

___ Make customer aware of optional equipment available so that customer can make proper choices as required.

___ Instruct customer how to lubricate and explain importance of lubrication.

___ Point out the safety decals. Explain their meaning and the need to keep them in place and in good condition. Emphasize the increased safety hazards when instructions are not followed.

___ Explain to customer that when transporting the cutter, the wing and center sections should be raised and their respective transport locks installed and pinned in place.

___ Present Operator's Manual and request that customer and all operators read it before operating equipment. Point out the manual safety rules, explain their meanings and emphasize the increased safety hazards that exist when safety rules are not followed.

___ Explain to customer the potential crushing hazards of going underneath raised equipment. Instruct that before going underneath to disconnect the driveline, securely block up all corners with jack stands and to follow all instructions in the BLOCKING METHOD, page 19 of the operator's manual. Explain that blocking up prevents equipment dropping from hydraulic leak down, hydraulic system failures or mechanical component failures.

___ Point out all guards and shields. Explain their importance and the safety hazards that exist when not kept in place and in good condition.

___ Explain to customer that when towing on a public road to comply with all state and local lighting/marking laws and to use a safety tow chain.

# WOODS

# PARTS INDEX

## BATWING® Rotary Cutter

### BW12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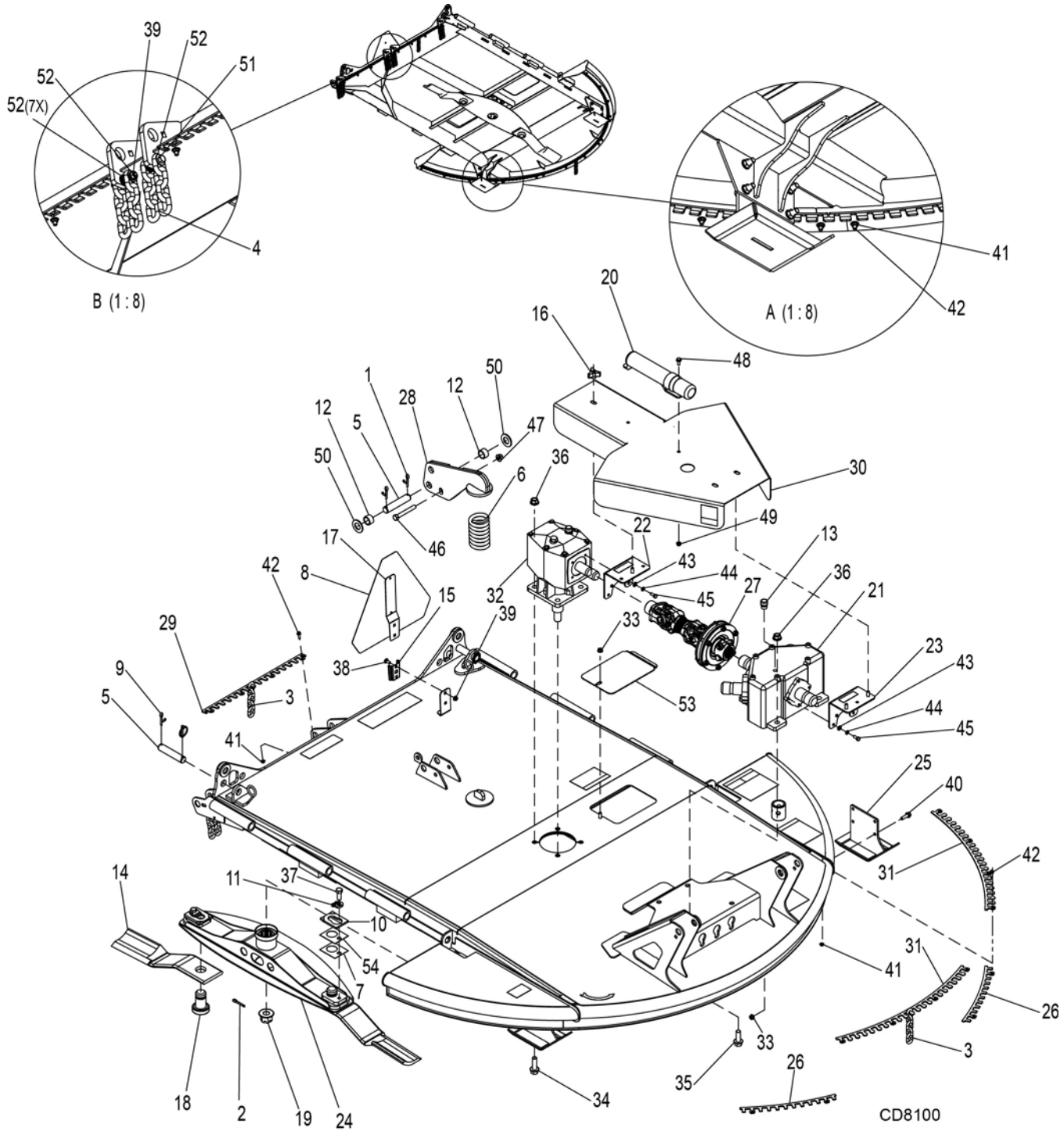
## CENTER FRAME ASSEMBLY



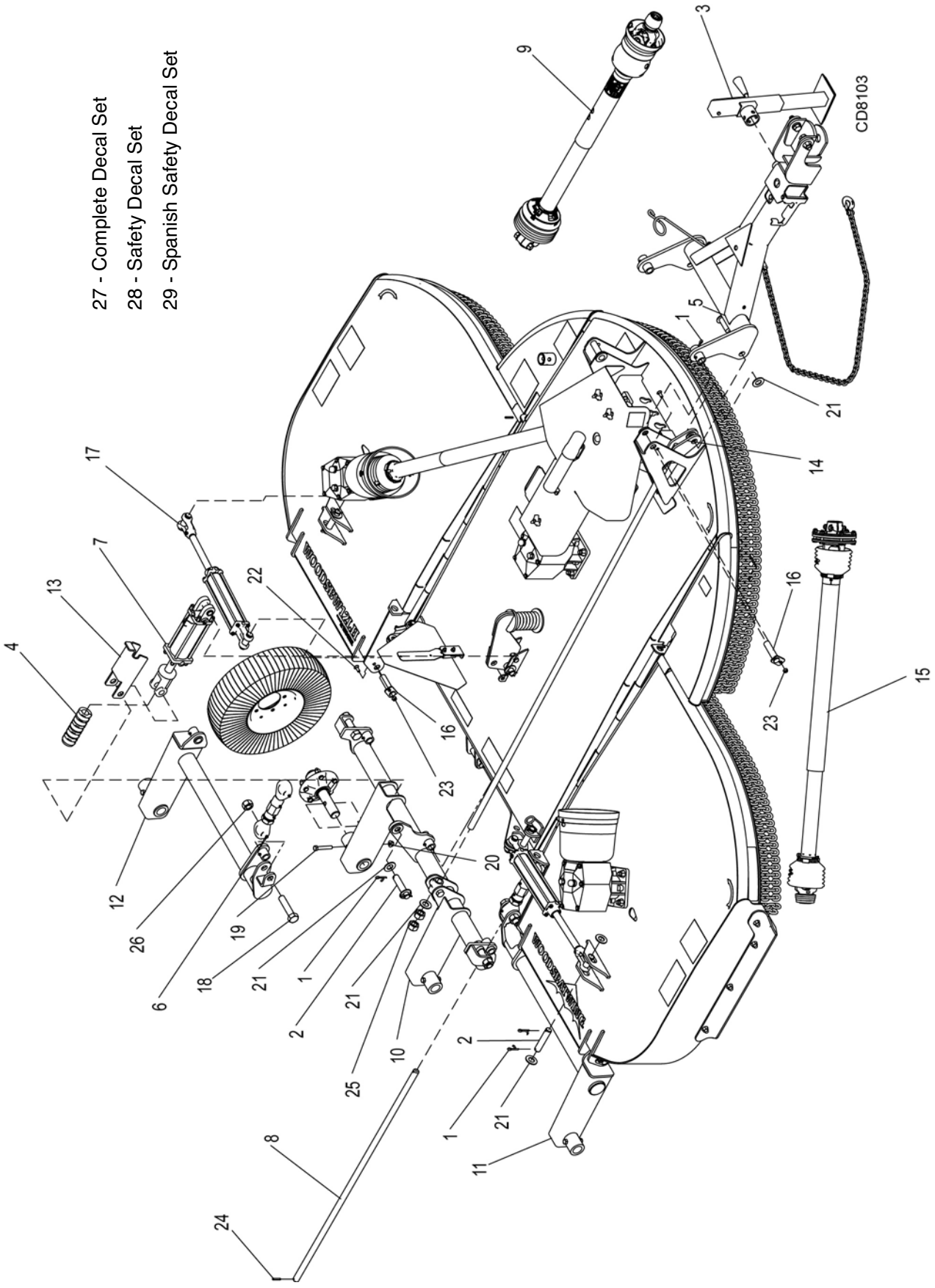
## CENTER FRAME ASSEMBLY PARTS

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 1285 * | 3 | 1/4 X 1-1/2 Cotter pin |
| 3 | 3994 | 122 | 5/16 Chain5 link |
| 4 | 4069 | 8 | 5/16 Chain 4 link |
| 5 | 8345 | 3 | 1.00 X 4.08 PinHdls |
| 6 | 13316 | 1 | SPR/CMP 3.00 .50 6.2 |
| 7 | 13946 | 2 | Shim, 20 GA, 1-1/2 blade pin |
| 8 | 24611 | 1 | (SMV) Slow Moving Vehicle Sign |
| 9 | 30695 | 2 | Asy klik pin, chn, cot 12.5 |
| 10 | 32603 | 2 | Keyhole plate - special |
| 11 | 32604 | 2 | Blade pin lock clip - special |
| 12 | 33647 | 2 | Spacer, 3/4 |
| 13 | 57076 | 1 | 1/2 Breather plug |
| 14 | 57099KT | 1 | .50x4.00x19.00 Blade |
| 15 | 62484 | 1 | SMV Socket |
| 16 | 66840 | 3 | 3/8 NC 3-Prong knob |
| 17 | 1004251 | 1 | SMV Bracket |
| 18 | 1009199 | 2 | 2.04 Pin/blade |
| 19 | 1018331 * | 1 | 1-14 Slotted flanged nut |
| 20 | 1026530 | 1 | Manual tube |
| 21 | 1038897 | 1 | 1:1.35 Gearbox splitter |
| 22 | 1035093 | 1 | BW12 Shield standoff RR |
| 23 | 1035094 | 1 | BW12 Shield standoff FT |
| 24 | 1037978 | 1 | Crossbar CTR |
| 25 | 1038001 | 2 | BW12 Skid shoe |
| 26 | 1038002 | 2 | Front, center, chain bar |
| 27 | 1038049 | 1 | 1.75-20 Drive 2JT W300E |
| 28 | 1038078 | 1 | BW12 Spring arm |
| 29 | 1038090 | 2 | Center chain lock |
| 30 | 1038092 | 1 | BW12 Center shield |
| 31 | 1038110 | 3 | Center chain lock winglet |
| 32 | 1038888 | 1 | Gearbox, repair 1:1.69 CCW |
| 33 | 14350 * | 9 | 3/8 NC Flanged lock nut |
| 34 | 1038890 | 4 | 5/8 NC x 2 Hex flanged screw GR8 |
| 35 | 19024 | 4 | 5/8 NC x 1-3/4 Hex flanged screw GR5 |
| 36 | 19025 * | 8 | 5/8 NC Flanged lock nut |
| 37 | 6100 * | 2 | 1/2 NC x 1-1/4 HHCS GR5 |
| 38 | 16148 * | 2 | 5/16NC x 3/4 Carriage bolt ZP |
| 39 | 14139 * | 6 | 5/16 NC Flanged lock nut HD |
| 40 | 1033958 | 8 | 3/8NC x 1-1/4 Hex screw |
| 41 | 70065 * | 24 | 1/4 NC Whiz nut |
| 42 | 70046 | 24 | .25-20 x .75 Bolt whiz |
| 43 | 35155 * | 5 | 5/16 SAE Flat washer ZP |
| 44 | 2472 * | 5 | 5/16 Lock washer ZP |
| 45 | 24801 | 5 | M8-1.25P x 20mm HHCS |
| 46 | 12024 * | 1 | 1/2 NC x 3-3/4 HHCS GR5 |
| 47 | 11900 * | 1 | 1/2 NC Flanged lock nut |
| 48 | 71851 | 2 | 5/16 NC x 3/4 Flanged cap screw |
| 49 | 73163 * | 2 | 5/16 NC Flanged whiz nut |
| 50 | 1863 * | 2 | 1 SAE Flat washer |
| 51 | 300105 | 4 | 5/16 NC x 2 HHCS GR5 |
| 52 | 4378 * | 36 | 5/16 Standard flat washer ZP |
| 53 | 1038884 | 1 | Deck cover plate |
| 54 | 10520 | 2 | Shim, 18 GA, 1-1/2 blade pin |

HHCS Hex Head Cap Screw

* Standard hardware, obtain locally

## MAIN ASSEMBLY



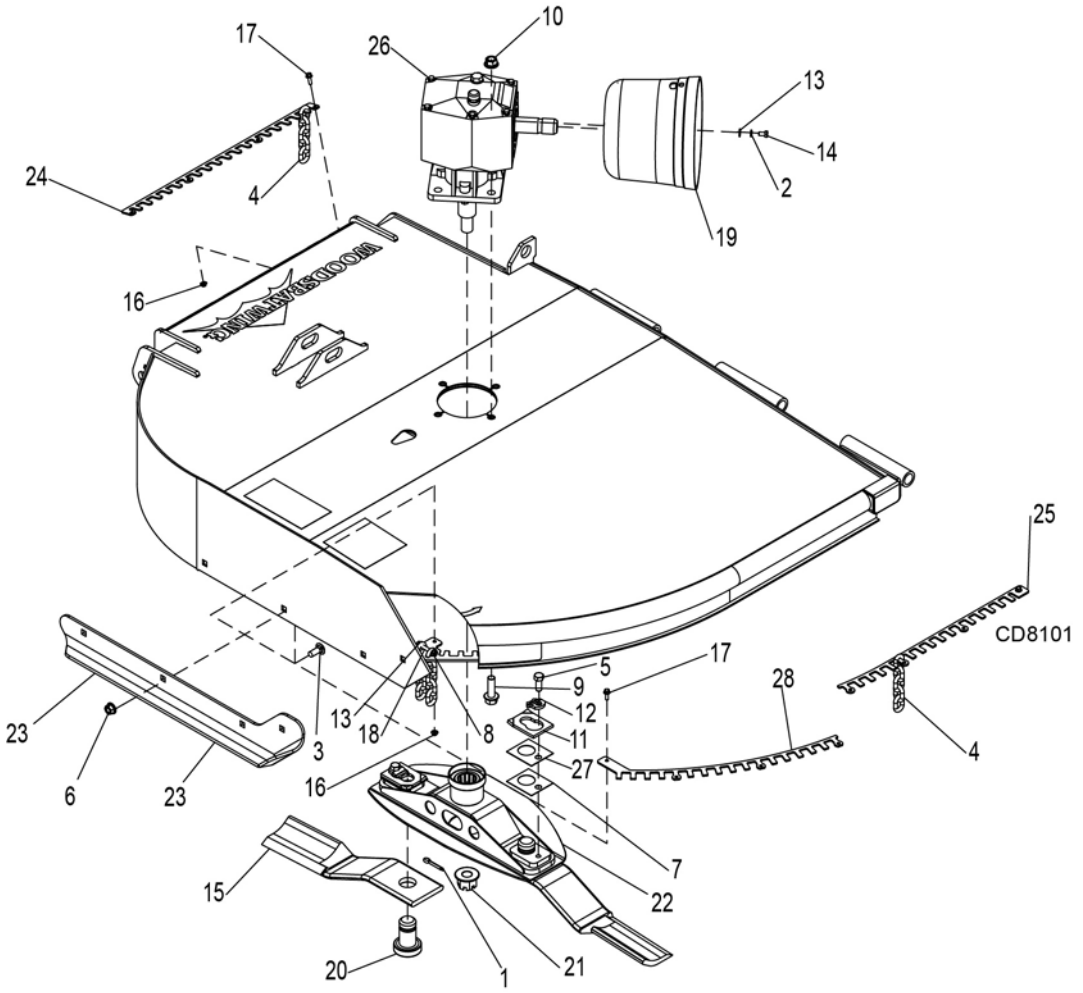
## MAIN ASSEMBLY PARTS

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 1285 * | 7 | 1/4 x 1-1/2 Cotter pin |
| 2 | 8345 | 3 | 1.00 x 4.08 Pin hdls |
| 3 | 23790 | 1 | Swivel parking jack |
| 4 | 24098A | 1 | 1-1/4 Cyl srtk cntrl set |
| 5 | 46605 | 1 | 1.00 x 4.08 Clevis pin |
| 6 | 1003690 | 2 | Adjustable link |
| 7 | 1035089 | 1 | 3 x 6 Hyd cylinder |
| 7a | 1038883 | 1 | Seal kit for 1035089 |
| 8 | 1037983 | 2 | Hinge pin |
| 9 | 1038051 | 1 | 43.75x57.31 Drv asy compl-CV 35E |
| 10 | 1038057 | 1 | Wheel yoke, center |
| 11 | 1038058 | 1 | Wheel yoke, right |
| 12 | 1038059 | 1 | Wheel yoke, left |
| 13 | 1038065 | 1 | Transport lock-up |
| 14 | 1038084 | 1 | Attitude rod |
| 15 | 1038095 | 2 | 39.8x56.4 Drv asy cmpl W300E |
| 16 | 1038100 | 9 | 1.0 x 3.84 Pin |
| 17 | 1038881 | 2 | 2 x 10 Cylinder 1.06 rod |
| 17a | 1038882 | 1 | Seal kit for 1038881 |
| 18 | 46752 * | 4 | 1 NC x 4.50 HHCS GR5 ZP |
| 19 | 3489 * | 4 | 1/2 NC x 3 HHCS GR5 ZP |
| 20 | 11900 * | 4 | 1/2 NC Flanged lock nut |
| 21 | 1863 * | 8 | 1 SAE Flat washer |
| 22 | 6697 * | 9 | 3/8 NC x 1 Carriage bolt GR5 ZP |
| 23 | 14350 * | 9 | 3/8 NC x Flanged lock nut |
| 24 | 66016 | 4 | 1/4 x 1-1/2 Spirol pin |
| 25 | 3132 * | 2 | 1 NC Hex nut ZP |
| 26 | 34279 * | 4 | 1 NC Lock nut |
| 27 | 1039931 | 1 | Complete decal set |
| 28 | 1003679 | 1 | Safety decal set |
| 29 | 1036791 | 1 | Spanish safety decal set |

HHCS Hex Head Cap Screw

* Standard hardware, obtain locally

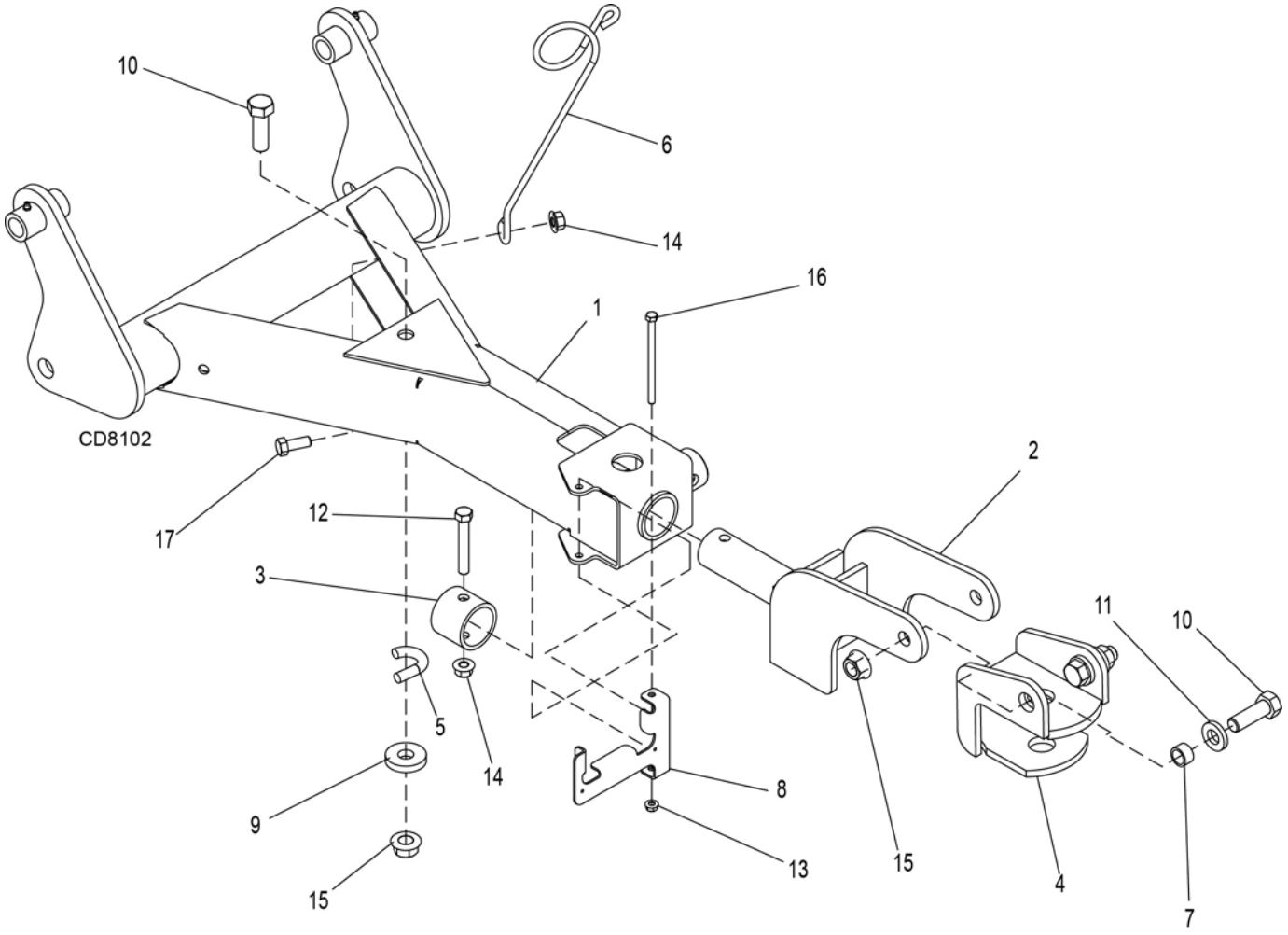
## WING ASSEMBLY




| REF | PART | | QTY | DESCRIPTION |
|---|---|---|---|---|
| 1 | 1285 | * | 1 | 1/4 x 1-1/2 Cotter pin |
| 2 | 2472 | * | 4 | 5/16 Lock washer ZP |
| 3 | 2615 | * | 4 | 1/2 NC x 1-1/4 Carriage bolt ZP |
| 4 | 3994 | | 54 | 5/16 Chain 5 link |
| 5 | 6100 | * | 2 | 1/2 NC x 1-1/4 HHCS GR5 ZP |
| 6 | 11900 | * | 4 | 1/2 NC Flanged lock nut |
| 7 | 13946 | | 2 | Shim, 20 GA, 1-1/2 blade pin |
| 8 | 14139 | * | 1 | 5/16 NC Flanged lock nut HD ZP |
| 9 | 1038890 | | 4 | 5/8 NC x 2 Hex flanged screw GR8 |
| 10 | 19025 | * | 4 | 5/8 NC Flanged lock nut |
| 11 | 32603 | | 2 | Keyhole plate - special |
| 12 | 32604 | | 2 | Blade pin lock clip - special |
| 13 | 35155 | * | 5 | 5/16 SAE Flat washer ZP |
| 14 | 39254 | | 4 | M8-1.25P x 14mm HHCS CL8.8 |
| 15a | 57099KT | | 1 | Blade kit 57099 (right wing) -or- |
| 15b | 1003490KT | | 1 | Blade kit 1003490 (left wing) |
| 16 | 70065 | * | 12 | 1/4 NC Whiz nut |

| REF | PART | | QTY | DESCRIPTION |
|---|---|---|---|---|
| 17 | 70046 | | 12 | .25-20 x .75 Hex/MR Whiz bolt |
| 18 | 300105 | * | 1 | 5/16 NC x 2 HHCS GR5 ZP |
| 19 | 1002048 | | 1 | Clutch shield, 100&143 MM BC |
| 20 | 1009199 | | 2 | 2.04 Pin/blade |
| 21 | 1018331 | * | 1 | 1-14 Slotted flanged nut |
| 22 | 1037979 | | 1 | Crossbar wing |
| 23a | 1038044 | | 1 | BW12 Skid shoe, RT |
| 23b | 1038045 | | 1 | BW12 Skid shoe, LT |
| 24 | 1038108 | | 1 | Chain lock, wing |
| 25 | 1038109 | | 1 | Chain lock, wing front |
| 26a | 1038887 | | 1 | Gearbox repair 1:1.69 CW (right wing) |
| 26b | 1038888 | | 1 | Gearbox repair 1:1.69 CCW (left wing) |
| 27 | 10520 | | 2 | Shim, 18 GA, 1-1/2 blade pin |
| 28 | 1038932 | | 1 | Chain lock, wing curved |
| | HHCS | | | Hex Head Cap Screw |
| | | * | | Standard hardware, obtain locally |

# 1035099 TONGUE ASSEMBLY



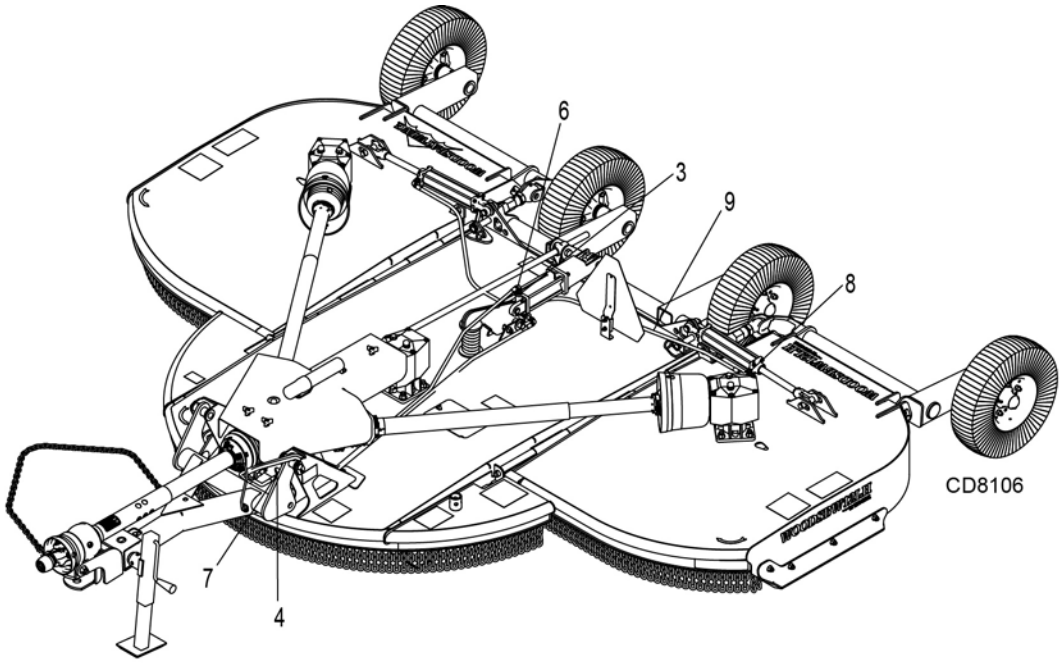

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 1038050 | 1 | BW12 Tongue |
| 2 | 1035096 | 1 | BW12 Level hitch |
| 3 | 1038875 | 1 | 2.06 x 2.5 x 2.00 Sleeve |
| 4 | 1038085 | 1 | BW12 Catg 2 Clevis |
| 5 | 19407 | 1 | Safety chain asy 6400lb |
| 6 | 3443 | 1 | Hydraulic hose holder |
| 7 | 13087 | 2 | 3/4 x 1 x 9/16 Sleeve HT |
| 8 | 1038072 | 1 | CV drive holder |
| 9 | 8424 | 1 | 3/4ID 20D 3/8 Washer, thick |

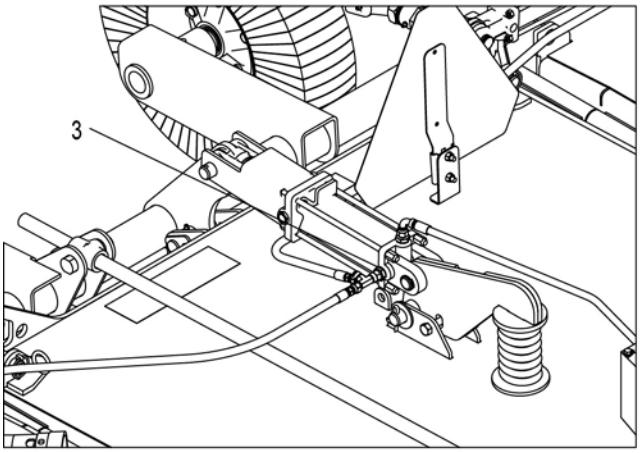
| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 10 | 13759 * | 3 | 3/4 NC x 2-1/4 HHCS GR5 ZP |
| 11 | 28873 | 2 | 3/4ID 1-1/20D 1/4 Washer, thick |
| 12 | 14069 * | 1 | 1/2 NC x 3-1/4 HHCS |
| 13 | 14139 * | 1 | 5/16 NC Flanged lock nut HD ZP |
| 14 | 11900 * | 2 | 1/2 NC Flanged lock nut |
| 15 | 302207 * | 3 | 3/4 NC Flanged lock nut |
| 16 | 58423 * | 1 | 5/16 NC x 5 HHCS GR5 ZP |
| 17 | 6100 * | 1 | 1/2 NC x 1-1/4 HHCS GR5 ZP |

HHCS Hex Head Cap Screw

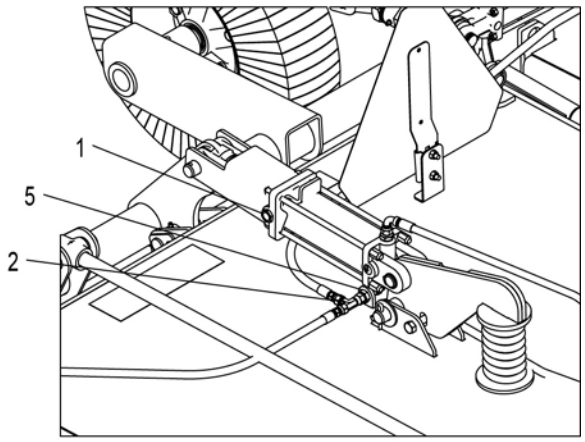
* Standard hardware, obtain locally

## 1038122 HOSE ASSEMBLY




Single hose set-up



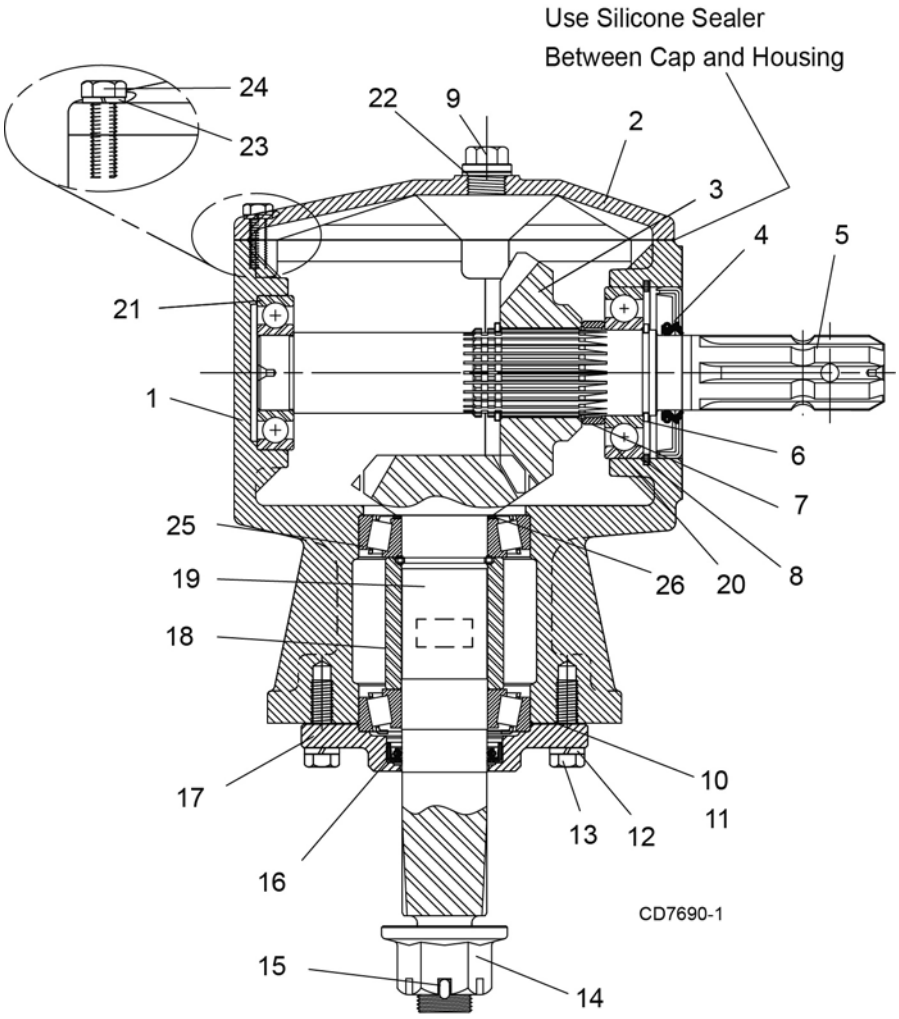

Two hose set-up
(Shipped from factory)

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 11975 | 1 | 1/2 NPT Vent plug |
| 2 | 312017 | 1 | Swivel run tee |
| 3 | 54315 | 2 | 1/2 NPTM 9/16 JICM Adapter |
| 4 | 1038891 | 2 | 1/4NPTF 1/2NPTM Adapter rstr .06 |
| 5 | 1009496 | 1 | 9/16 JIC 9/16 JIC Adapter |
| 6 | 1038123 | 2 | Hose, 1/4 154 1/4NPT 9/16JICF 90 |
| 7 | 66511 | 2 | 1/2 NPT Male coupler |
| 8 | 63480 | 2 | 3/8 NPTM 9/16 JICM Adapter |
| 9 | 1014239 | 2 | Hose, 1/4 54 9/16JICF 9/16JICF |

HHCS Hex Head Cap Screw

* Standard hardware, obtain locally

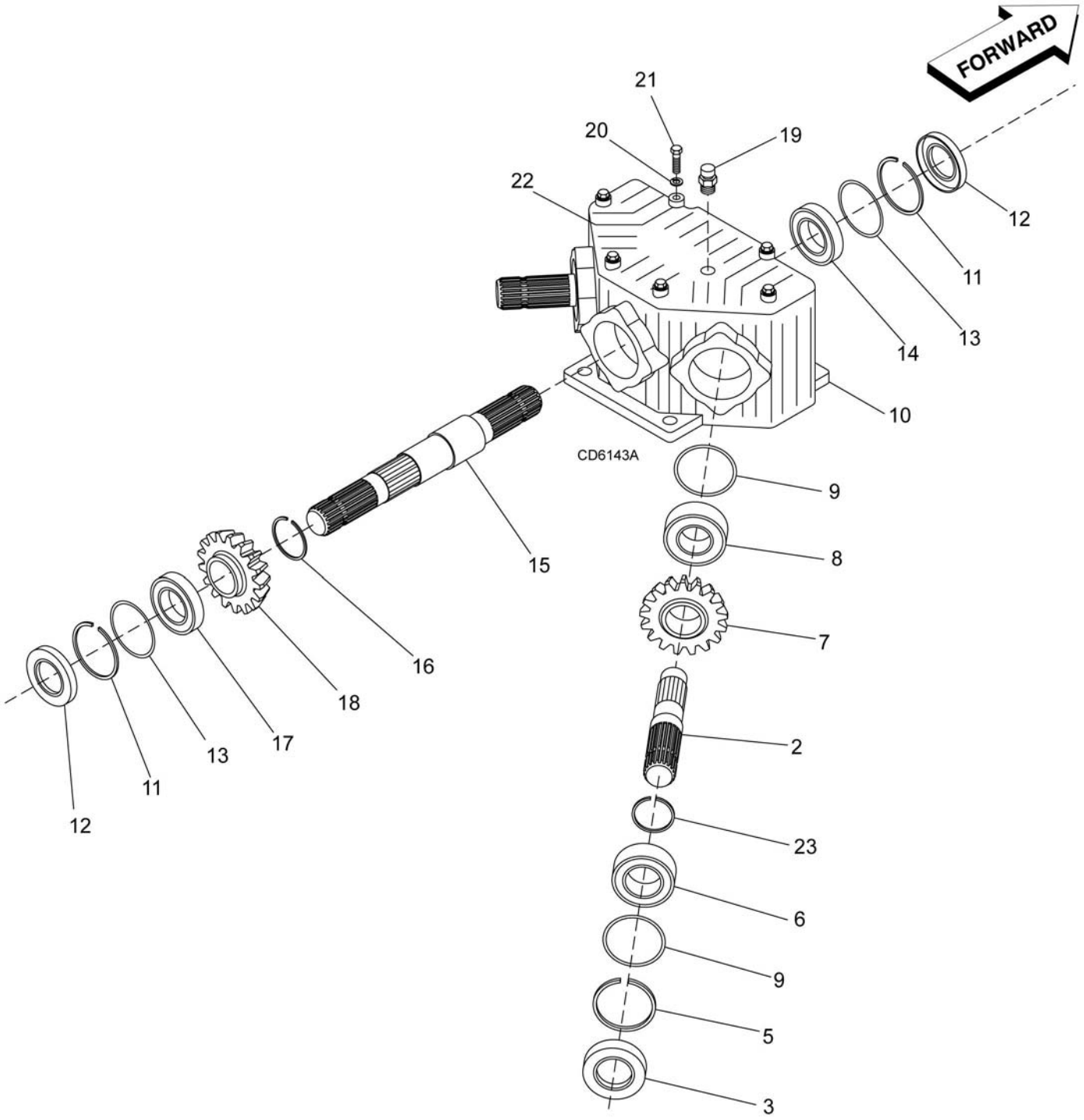
## GEARBOX ASSEMBLY




| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| A | 1038887 | 1 | Gearbox repair 1:1.69 CW (Right) |
| A | 1038888 | 1 | Gearbox repair 1:1.69 CCW (Left and Center) |
| 1 | ----- | 1 | Housing |
| 2 | 1019632 | 1 | Inspection cover |
| 3 | ----- | 1 | 22 Tooth gear |
| 4 | 1018327 | 1 | Input seal |
| 5 | ----- | 1 | Input shaft |
| 6 | ----- | 1 | Retaining ring |
| 7 | ----- | 1 | Gear spacer |
| 8 | ----- | 1 | Retaining ring |
| 9 | 1011780 | 1 | Vent plug and washer |

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 10 | 1018329 | A/R | Output gasket (0.30) |
| 11 | 1018330 | A/R | Output gasket (0.13) |
| 12 | ----- | 4 | Lock washer |
| 13 | ----- | 4 | M10 x 1.5 x 25 Cap screw |
| 14 | 1018331 | 1 | 1" - 14 Slotted flange nut |
| 15 | ----- | 1 | Cotter pin |
| 16 | 1018328 | 1 | Output seal |
| 17 | ----- | 1 | Output cap |
| 18 | ----- | 1 | Output bearing spacer |
| 19 | ----- | 1 | Output shaft and pinion |
| 20 | 1018326 | 3 | Ball bearing |
| 21 | 1018325 | 1 | Ball bearing |
| 22 | ----- | 2 | Sealing washer w/plug |
| 23 | ----- | 6 | Lock washer |
| 24 | ----- | 6 | M8 x 1.5 x 25 Cap screw |
| 25 | 57478 | 2 | Bearing cup and cone |
| 26 | 1032963 | 1 | Shim Kit |
| 27 | ----- | 1 | Output Bearing Spacer |

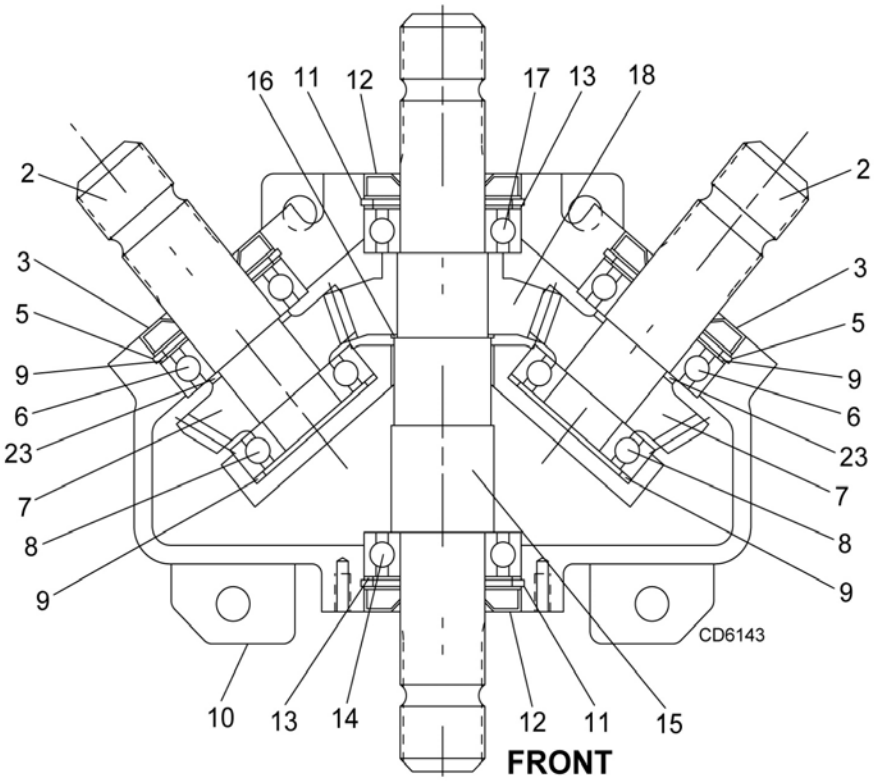
## SPLITTER GEARBOX ASSEMBLY



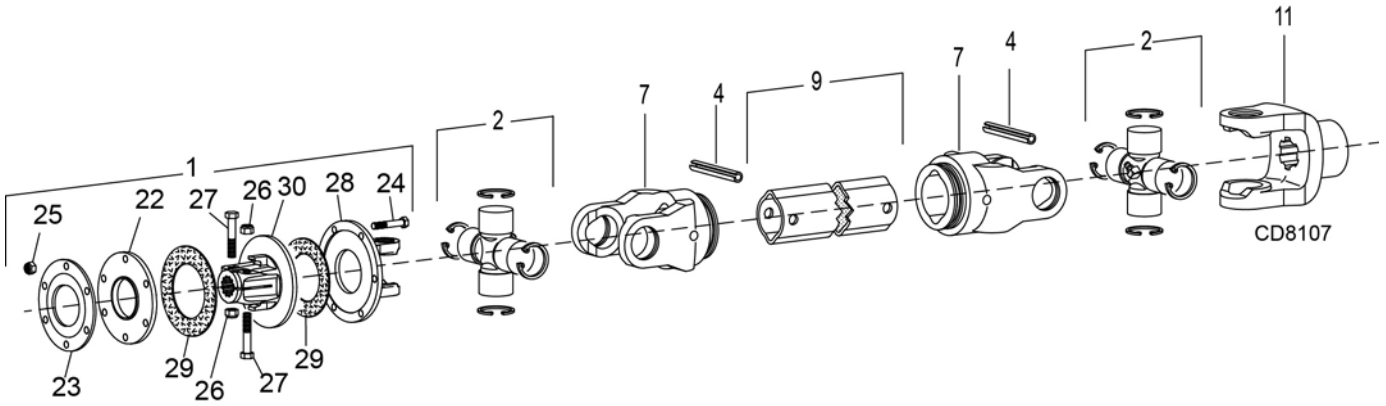
## SPLITTER GEARBOX ASSEMBLY

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 1038897 | - | Complete splitter gearbox |
| 2 | 1005308 | 2 | Shaft 1-3/4-20 spline, wing |
| 3 | 1005304 | 2 | Oil seal |
| 4 | ------- | 2 | 3/8 Plug (not shown) |
| 5 | 39251 | 2 | Snap ring |
| 6 | 20891 | 2 | Bearing |
| 7 | 1005305 | 2 | Gear |
| 8 | 39414 | 2 | Bearing |
| 9 | 1005306 | 4 | Shim |
| 10 | ------- | 1 | Casting |
| 11 | 57320 | 2 | Snap ring |
| 12 | 57318 | 2 | Oil seal |
| 13 | 1005307 | 2 | Shim |
| 14 | 1005319 | 1 | Bearing |
| 15 | 1005303 | 1 | Shaft 1-3/4-20 spline, center |
| 16 | 1005309 | 1 | Snap ring |
| 17 | 1005319 | 1 | Bearing |
| 18 | 1005310 | 1 | Gear |
| 19 | 57076 | 1 | 1/2 Breather |
| 20 | 2472 | * | 5/16 Lock washer, standard |
| 21 | ------- | * | M8 x 30 mm HHCS CL 8.8 |
| 22 | 1005311 | 1 | Cover |
| 23 | 20895 | 2 | Snap ring |

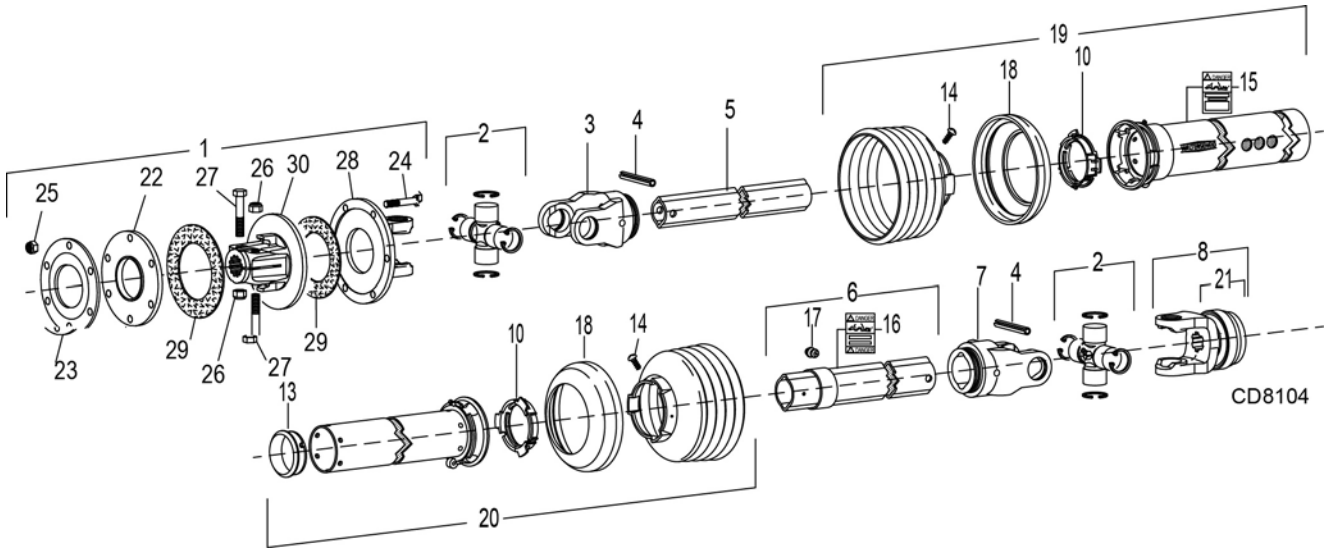
* Standard hardware, obtain locally



## CENTER DECK DRIVE ASSEMBLY

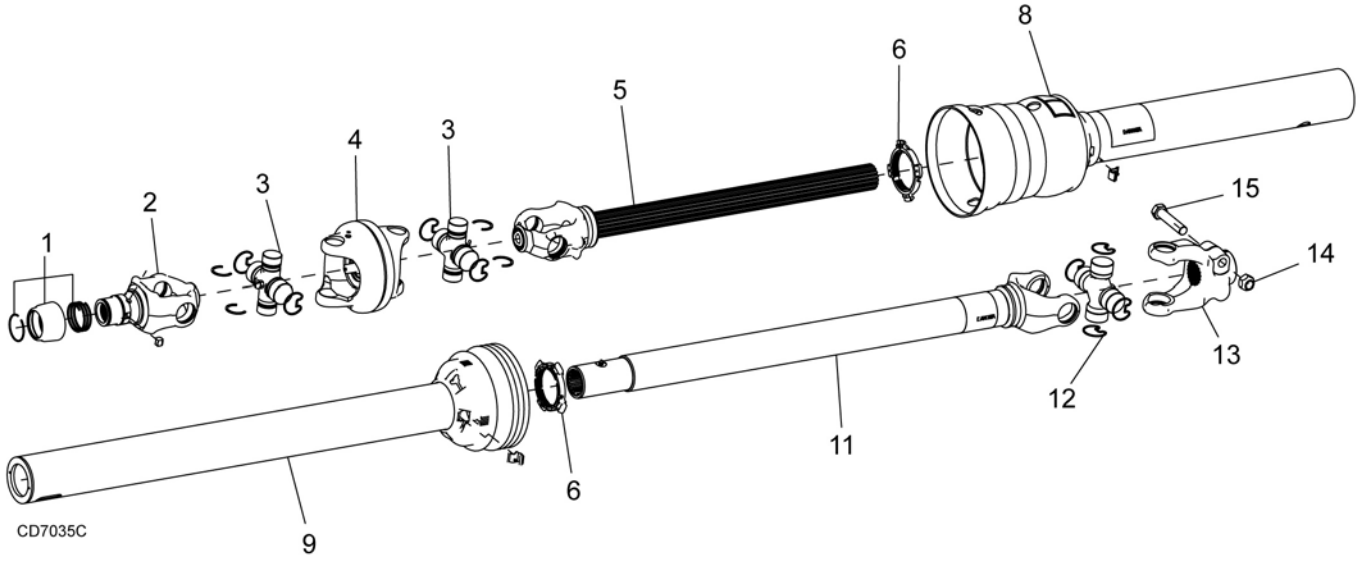



## WING DRIVE ASSEMBLY




| REF | PART CENTER DECK DRIVE | PART WING DRIVE | QTY | DESCRIPTION |
|---|---|---|---|---|
| A | 1038049 | 1038095 | | Complete drive assembly |
| 1 | 1029960 | 1029960 | 1 | Friction clutch |
| 2 | 38478 | 38478 | 2 | Cross and bearing kit |
| 3 | | 1029963 | 1 | Inboard yoke |
| 4 | 40775 | 40775 | 2 | 10 x 65 Spring pin |
| 5 | | 40583 | 1 | Inner profile |
| 6 | | 1029964 | 1 | Profile & sleeve |
| 7 | 1029961 | 1029961 | 1 | Inboard yoke |
| 8 | | 38498 | 1 | Yoke 1-3/8-6 SPL assy |
| 9 | 40592 | | 1 | Outer profile |
| 10 | | 40776 | 2 | Bearing ring |
| 11 | 1029962 | | 1 | Slip yoke |
| 13 | | 40780 | 1 | Support bearing |
| 14 | | 40778 | 2 | Screw, package of 10 |
| 15 | | 18864 | 1 | Decal, danger |
| 16 | | 33347 | 1 | Decal, danger |
| 17 | | 40779 | 1 | Grease fitting |
| 18 | | 1029932 | 2 | Reinforcing collar |
| 19 | | 1029965 | 1 | Outer guard half |
| 20 | | 1029966 | 1 | Inner guard half |
| 21 | | 40589 | 1 | 1.375-6&21 Slide collar kit |
| 22 | 57434 | 57434 | 1 | Thrust plate |
| 23 | 57435 | 57435 | 1 | Belleville spring |
| 24 | 57259 | 57259 | 6 | M10x1.5Px55mm HHCS 8.8 |
| 25 | 57260 | 57260 | 6 | M10 x 1.5P Hex lock nut |
| 26 | 57261 | 57261 | 2 | M12 x 1.75P Hex lock nut |
| 27 | 57262 | 57262 | 2 | M12x1.75Px65mm HHCS 8.8 |
| 28 | 57431 | 57431 | 1 | Flange Yoke |
| 29 | 57432 | 57432 | 1 | Friction Disc (pkg of 2) |
| 30 | 57440 | 57440 | 1 | Hub, 1-3/4, 20 Spline |

## CV DRIVE ASSEMBLY



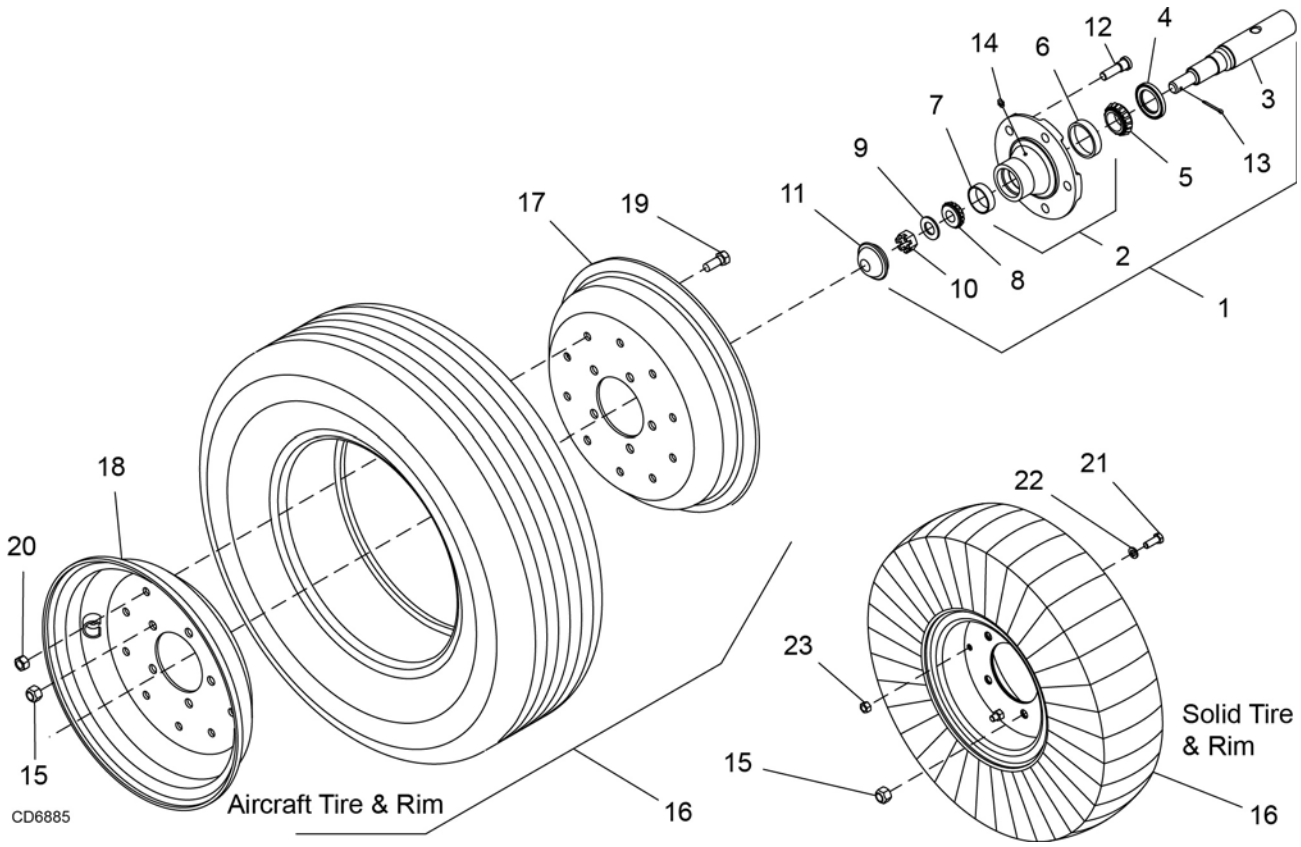

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| A | 1038051 | 1 | Complete CV drive |
| 1 | 19851 | 1 | Slide lock repair kit |
| 2 | 1032289 | 1 | Yoke QD CV 1-3/8 - 6 |
| 3 | 1032290 | 2 | CV U-Joint repair kit Cat 4 35E |
| 4 | 1032291 | 1 | CV Body with fitting |
| 5 | 1038893 | 1 | Yoke and shaft CV 1.31-20 spline |
| 6 | 1024636 | 2 | Drive shield bearing kit |
| 7 | 18864 † | 1 | Decal, danger rotating driveline (**see page 12**) |
| 8 | 1038892 | 1 | CV shield outer |
| 9 | 1038894 | 1 | CV shield inner |
| 10 | 33347 † | 1 | Decal, danger guard missing (**see page 13**) |
| 11 | 1038895 | 1 | Yoke, tube and slip sleeve |
| 12 | 1032296 | 1 | U-Joint cross and bearing kit |
| 13 | 1032269 | 1 | Yoke, 35R x 4.81 x SP 1.75 - 20 |
| 14 | 6239 * | 1 | 5/8 NC Lock nut |
| 15 | 34473 * | 1 | 5/8 NC x 3 HHCS GR5 |

† Not shown

HHCS Hex Head Cap Screw

* Standard hardware, obtain locally

## 5-BOLT WHEEL & TIRE ASSEMBLY



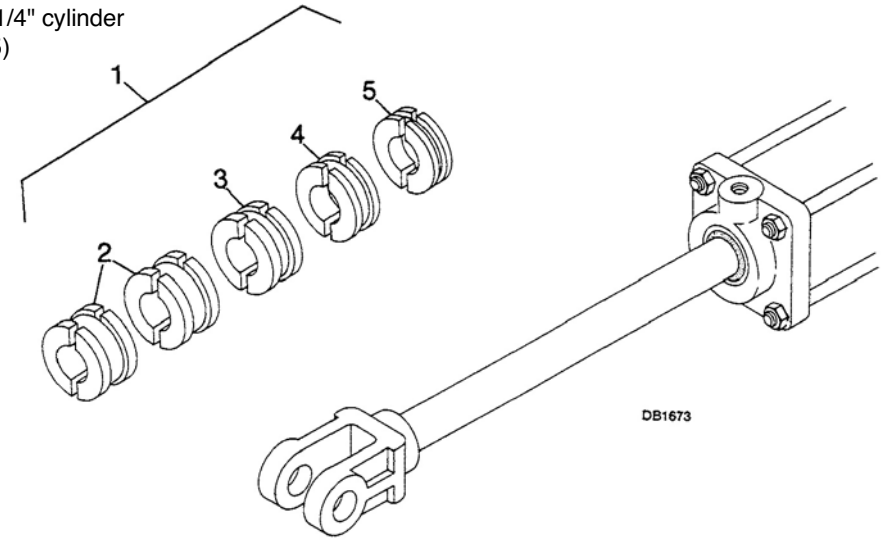

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 1017050 | 1 | Heavy hub assembly (includes items 1 through 15) |
| 2 | 1017034 | 1 | Heavy wheel hub with cups (includes items 6,7,14) |
| 3 | 1017033 | 1 | Axle |
| 4 | 1017027 | 1 | Seal |
| 5 | 1017028 | 1 | Bearing cone |
| 6 | 1017036 | 1 | Bearing cup |
| 7 | 1017037 | 1 | Bearing cup |
| 8 | 1017029 | 1 | Bearing cone |
| 9 | 1017031 | 1 | Washer |
| 10 | 1017032 | 1 | Castle nut |
| 11 | 1017035 | 1 | Hub cap |
| 12 | 1017038 | 5 | Stud |
| 13 | 1017069 | 1 | Cotter pin |
| 14 | 1017067 | 1 | Grease fitting |
| 15 | 35317 | 5 | Nut, lug 1/2 NF |

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 16 | 1017040 | 1 | 21" Solid laminate tire, rim & hardware - 5 bolt **-or-** |
| 16 | 1028820 | 1 | 24 x 7.25 x 12 Aircraft tire, rim & hardware - 5 bolt **-or-** |
| 16 | 1028820F | 1 | 24 x 7.25 x 12 Aircraft tire, rim & hardware, foam filled - 5 bolt **-or-** |
| 16 | 1039976 | 1 | Whl assy 25.5 x 8-14 20 PR TRAKS **-or-** |
| 16 | 1039976F | 1 | Whl assy 25.5 x 8-14 Foam TRAKS |
| 17 | 1028821 | 1 | 12.0 x 6 Rim half (for 24" aircraft wheel only) **-or-** |
| 18 | 1028822 | 1 | 12.0 x 6 Rim half (for 24" aircraft wheel only) |
| 19 | 6100 * | | 1/2 NC x 1-1/4 HHCS GR5 |
| 20 | 765 * | | 1/2 NC Lock nut |
| 21 | 19887 * | | 3/8 NC x 1 HHCS GR8 |
| 22 | 838 * | | 3/8 Standard lock washer |
| 23 | 835 * | | 3/8 NC Hex nut |
| - | 1017042 | 2 | Rim half for 6 x 9 solid tire |

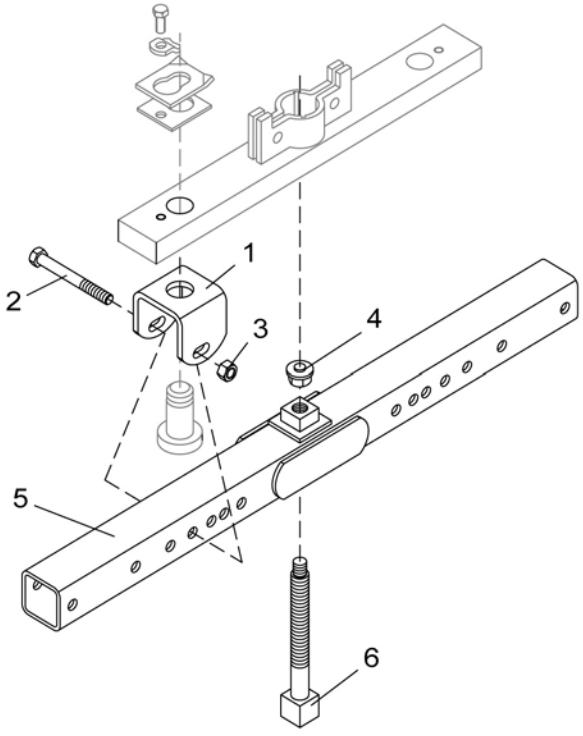
* Standard hardware, obtain locally

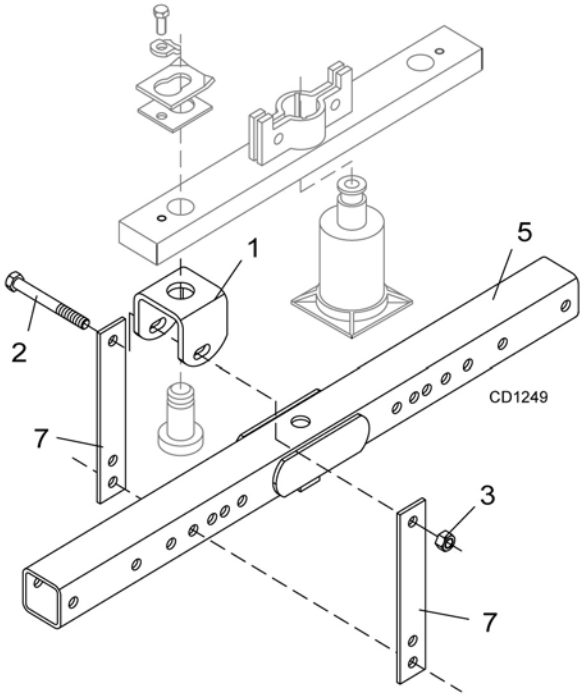
## HYDRAULIC CYLINDER STROKE CONTROL KIT

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 24098 | 1 | Stroke control set for 1-1/4" cylinder rod (contains items 2 - 5) |
| 2 | – – – – | 2 | 1-1/2" Segment |
| 3 | – – – – | 1 | 1-1/4" Segment |
| 4 | – – – – | 1 | 1" Segment |
| 5 | – – – – | 1 | 3/4" Segment |




## CROSSBAR PULLER (OPTIONAL)




| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| A | 8811 | 1 | Crossbar puller, complete |
| 1 | 19914 | 2 | Crossbar puller clevis |
| 2 | 3097 * | 4 | 5/8 NC x 4-1/2 HHCS GR5 |
| 3 | 230 * | 4 | 5/8 NC Hex nut |

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 4 | 24879 | 1 | Crossbar puller pad assembly |
| 5 | 24876 | 1 | Crossbar puller tube assembly |
| 6 | 24881 | 1 | Crossbar puller screw assembly |
| 7 | 24885 | 4 | Crossbar puller link |

* Standard hardware - obtain locally

# BOLT TORQUE CHART

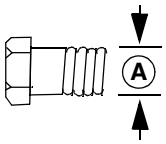
Always tighten hardware to these values unless a different torque value or tightening procedure is listed for a specific application.

Fasteners must always be replaced with the same grade as specified in the manual parts list.

Always use the proper tool for tightening hardware: SAE for SAE hardware and Metric for metric hardware.

Make sure fastener threads are clean and you start thread engagement properly.

All torque values are given to specifications used on hardware defined by SAE J1701 MAR 99 & J1701M JUL 96.




## SAE SERIES TORQUE CHART

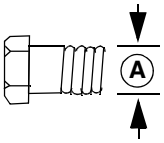
**SAE Grade 2 (No Dashes)**

SAE Bolt Head Identification

**SAE Grade 5 (3 Radial Dashes)**

**SAE Grade 8 (6 Radial Dashes)**

| Ⓐ Diameter (Inches) | Wrench Size | MARKING ON HEAD | | | | | |
|---|---|---|---|---|---|---|---|
| | | **SAE 2** | | **SAE 5** | | **SAE 8** | |
| | | lbs-ft | N-m | lbs-ft | N-m | lbs-ft | N-m |
| 1/4" | 7/16" | 6 | 8 | 10 | 13 | 14 | 18 |
| 5/16" | 1/2" | 12 | 17 | 19 | 26 | 27 | 37 |
| 3/8" | 9/16" | 23 | 31 | 35 | 47 | 49 | 67 |
| 7/16" | 5/8" | 36 | 48 | 55 | 75 | 78 | 106 |
| 1/2" | 3/4" | 55 | 75 | 85 | 115 | 120 | 163 |
| 9/16" | 13/16" | 78 | 106 | 121 | 164 | 171 | 232 |
| 5/8" | 15/16" | 110 | 149 | 170 | 230 | 240 | 325 |
| 3/4" | 1-1/8" | 192 | 261 | 297 | 403 | 420 | 569 |
| 7/8" | 1-5/16" | 306 | 416 | 474 | 642 | 669 | 907 |
| 1" | 1-1/2" | 467 | 634 | 722 | 979 | 1020 | 1383 |




## METRIC SERIES TORQUE CHART

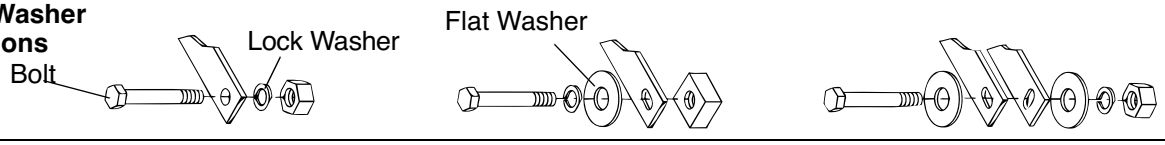
**Metric Grade 8.8**

Metric Bolt Head Identification

**Metric Grade 10.9**

| Ⓐ Diameter & Thread Pitch (Millimeters) | Wrench Size | **COARSE THREAD** | | | | **FINE THREAD** | | | | Ⓐ Diameter & Thread Pitch (Millimeters) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MARKING ON HEAD | | | | MARKING ON HEAD | | | | |
| | | **Metric 8.8** | | **Metric 10.9** | | **Metric 8.8** | | **Metric 10.9** | | |
| | | N-m | lbs-ft | N-m | lbs-ft | N-m | lbs-ft | N-m | lbs-ft | |
| 6 x 1.0 | 10 mm | 8 | 6 | 11 | 8 | 8 | 6 | 11 | 8 | 6 x 1.0 |
| 8 x 1.25 | 13 mm | 20 | 15 | 27 | 20 | 21 | 16 | 29 | 22 | 8 x 1.0 |
| 10 x 1.5 | 16 mm | 39 | 29 | 54 | 40 | 41 | 30 | 57 | 42 | 10 x 1.25 |
| 12 x 1.75 | 18 mm | 68 | 50 | 94 | 70 | 75 | 55 | 103 | 76 | 12 x 1.25 |
| 14 x 2.0 | 21 mm | 109 | 80 | 151 | 111 | 118 | 87 | 163 | 120 | 14 x 1.5 |
| 16 x 2.0 | 24 mm | 169 | 125 | 234 | 173 | 181 | 133 | 250 | 184 | 16 x 1.5 |
| 18 x 2.5 | 27 mm | 234 | 172 | 323 | 239 | 263 | 194 | 363 | 268 | 18 x 1.5 |
| 20 x 2.5 | 30 mm | 330 | 244 | 457 | 337 | 367 | 270 | 507 | 374 | 20 x 1.5 |
| 22 x 2.5 | 34 mm | 451 | 332 | 623 | 460 | 495 | 365 | 684 | 505 | 22 x 1.5 |
| 24 x 3.0 | 36 mm | 571 | 421 | 790 | 583 | 623 | 459 | 861 | 635 | 24 x 2.0 |
| 30 x 3.0 | 46 mm | 1175 | 867 | 1626 | 1199 | 1258 | 928 | 1740 | 1283 | 30 x 2.0 |

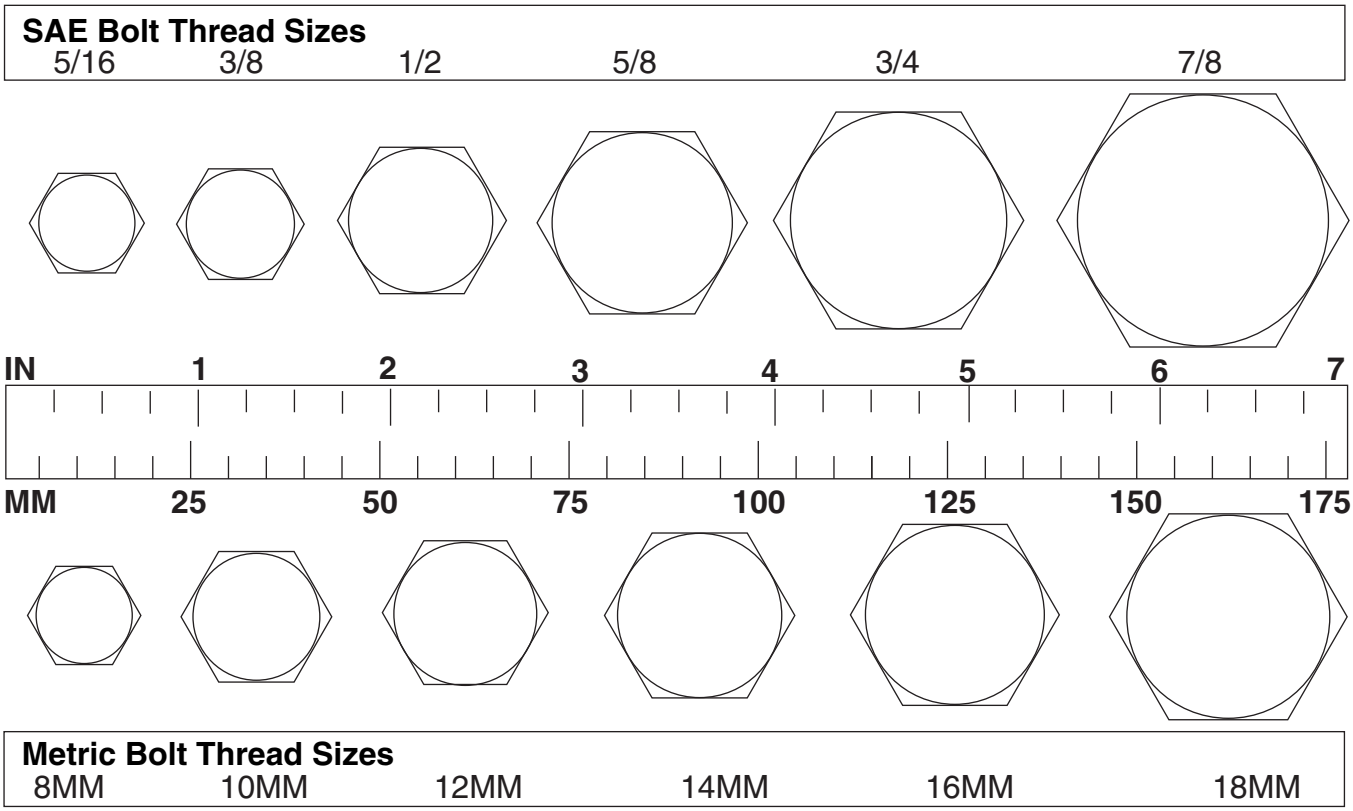
**Typical Washer Installations**




8/9/00

# BOLT SIZE CHART

**NOTE:** Chart shows bolt thread sizes and corresponding head (wrench) sizes for standard SAE and metric bolts.




# ABBREVIATIONS

AG ..... Agriculture
ASABE..... American Society of Agricultural & Biological Engineers (formerly ASAE)
ASAE ..... American Society of Agricultural Engineers
ATF ..... Automatic Transmission Fluid
BSPP .....British Standard Pipe Parallel
BSPTM ..... British Standard Pipe Tapered Male
CV.....Constant Velocity
CCW ..... Counter-Clockwise
CW.....Clockwise
F ..... Female
FT ..... Full Thread
GA ..... Gauge
GR (5, etc.) ..... Grade (5, etc.)
HHCS .....Hex Head Cap Screw
HT..... Heat-Treated
JIC .....Joint Industry Council 37° Degree Flare
LH .....Left Hand
LT..... Left
m.....Meter
mm.....Millimeter
M..... Male
MPa.....Mega Pascal
N.....Newton
NC .....National Coarse
NF .....National Fine
NPSM.....National Pipe Straight Mechanical
NPT ..... National Pipe Tapered
NPT SWF .....National Pipe Tapered Swivel Female
ORBM ..... O-Ring Boss - Male
P.....Pitch
PBY ..... Power-Beyond
psi.....Pounds per Square Inch
PTO..... Power Take Off
QD.....Quick Disconnect
RH .....Right Hand
ROPS ..... Roll-Over Protective Structure
RPM .....Revolutions Per Minute
RT ..... Right
SAE .....Society of Automotive Engineers
UNC .....Unified Coarse
UNF.....Unified Fine
UNS.....Unified Special

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# WARRANTY

All Models Except Mow'n Machine™ Zero-Turn Mowers

Please Enter Information Below and Save for Future Reference.

Date Purchased: _____ From (Dealer): _____

Model Number: _____ Serial Number: _____

Woods Equipment Company ("WOODS") warrants this product to be free from defect in material and workmanship. Except as otherwise set forth below, the duration of this Warranty shall be for TWELVE (12) MONTHS COMMENCING ON THE DATE OF DELIVERY OF THE PRODUCT TO THE ORIGINAL PURCHASER.

All current model loaders and backhoes are warranted for two (2) years from the date of delivery to the original purchaser.

The warranty periods for specific parts or conditions are listed below:

| Part or Condition Warranted | Model Number | Duration (from date of delivery to the original purchaser) |
|---|---|---|
| | **All units invoiced after 4/30/2012** | |
| Gearbox components | BB48X, BB60X, BB72X, BB84X, BB600X, BB720X, BB840X, BB6000X, BB7200X, BB8400X, DS1260, DSO1260, DS1440, TS1680, | 6 years |
| | BW12, BW15LH, BW126X, BW180X, BW126XHD, BW180XHD, BW1260X, BW1800X, | |
| | BW240X, BW240XHD, BW1620X, BW2400X | |
| | DS96, DS120, RCC42, RD990X, PRD6000, PRD7200, PRD8400, S15CD, S20CD, S22CD, S25CD, S27CD, S30CD, TC/R74, TC/R68, TC/R60, TBW144, TBW180, TBW204, TSG50, S12ED, S15ED, S18ED, S20ED, TPD25, TPD35, TPD65, TPD95 | |
| | RDC54, RD60, RD72, TBW150C, TS/R60, TS/R52, TS/R44, HC48, HC54, HC60, HC72, RC3.5, RC4, RC5, RC6 | 3 years (1 year if used in rental or commercial applications) |
| Blade spindles | RD990X, PRD6000, PRD7200, PRD8400, TBW144, TBW180, TBW204 | 3 years |
| Rust-through | BB600X, BB720X, BB840X, BB6000X, BB7200X, BB8400X, BW126X, BW180X, BW126XHD, BW180XHD, BW1260X, BW1800X, BW240, BW240HD, DS1260, DSO1260, DS1440, TS1680 | 10 years |

Under no circumstances will this Warranty apply in the event that the product, in the good faith opinion of WOODS, has been subjected to improper operation, improper maintenance, misuse, or an accident. This Warranty does not apply in the event that the product has been materially modified or repaired by someone other than WOODS, a WOODS authorized dealer or distributor, and/or a WOODS authorized service center. This Warranty does not cover normal wear or tear, or normal maintenance items. This Warranty also does not cover repairs made with parts other than those obtainable through WOODS.

This Warranty is extended solely to the original purchaser of the product. Should the original purchaser sell or otherwise transfer this product to a third party, this Warranty does not transfer to the third party purchaser in any way. There are no third party beneficiaries of this Warranty.

WOODS makes no warranty, express or implied, with respect to engines, batteries, tires or other parts or accessories not manufactured by WOODS. Warranties for these items, if any, are provided separately by their respective manufacturers.

WOODS' obligation under this Warranty is limited to, at WOODS' option, the repair or replacement, free of charge, of the product if WOODS, in its sole discretion, deems it to be defective or in noncompliance with this Warranty. **The product must be returned to WOODS with proof of purchase within thirty (30) days after such defect or noncompliance is discovered or should have been discovered, routed through the dealer and distributor from whom the purchase was made, transportation charges prepaid.** WOODS shall complete such repair or replacement within a reasonable time after WOODS receives the product. THERE ARE NO OTHER REMEDIES UNDER THIS WARRANTY. THE REMEDY OF REPAIR OR REPLACEMENT IS THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE OF THIS WARRANTY. WOODS MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, AND WOODS SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY AND/OR ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

**WOODS shall not be liable for any incidental or consequential losses, damages or expenses, arising directly or indirectly from the product, whether such claim is based upon breach of contract, breach of warranty, negligence, strict liability in tort or any other legal theory.** Without limiting the generality of the foregoing, Woods specifically disclaims any damages relating to (i) lost profits, business, revenues or goodwill; (ii) loss of crops; (iii) loss because of delay in harvesting; (iv) any expense or loss incurred for labor, supplies, substitute machinery or rental; or (v) any other type of damage to property or economic loss.

This Warranty is subject to any existing conditions of supply which may directly affect WOODS' ability to obtain materials or manufacture replacement parts.

No agent, representative, dealer, distributor, serviceperson, salesperson, or employee of any company, including without limitation, WOODS, its authorized dealers, distributors, and service centers, is authorized to alter, modify, or enlarge this Warranty. Answers to any questions regarding warranty service and locations may be obtained by contacting:

**Woods Equipment**
A Blount International Company
2606 South Illinois Route 2
Post Office Box 1000
Oregon, Illinois 61061 USA
800-319-6637 tel
800-399-6637 fax
woodsequipment.com

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**CENTRAL FABRICATORS®**
**GANNON®**
**GILL®**
**WAIN-ROY®**
**WOODS®**

# WARRANTY

(Replacement Parts For All Models Except Mow'n Machine™
Zero-Turn Mowers and Woods Boundary™ Utility Vehicles)

Woods Equipment Company ("WOODS") warrants this product to be free from defect in material and workmanship for a period of ninety (90) days from the date of delivery of the product to the original purchaser with the exception of V-belts, which will be free of defect in material and workmanship for a period of 12 months.

Under no circumstances will this Warranty apply in the event that the product, in the good faith opinion of WOODS, has been subjected to improper operation, improper maintenance, misuse, or an accident. This Warranty does not cover normal wear or tear, or normal maintenance items.

This Warranty is extended solely to the original purchaser of the product. Should the original purchaser sell or otherwise transfer this product to a third party, this Warranty does not transfer to the third party purchaser in any way. There are no third party beneficiaries of this Warranty.

WOODS' obligation under this Warranty is limited to, at WOODS' option, the repair or replacement, free of charge, of the product if WOODS, in its sole discretion, deems it to be defective or in noncompliance with this Warranty. **The product must be returned to WOODS with proof of purchase within thirty (30) days after such defect or noncompliance is discovered or should have been discovered, routed through the dealer and distributor from whom the purchase was made, transportation charges prepaid.** WOODS shall complete such repair or replacement within a reasonable time after WOODS receives the product. THERE ARE NO OTHER REMEDIES UNDER THIS WARRANTY. THE REMEDY OF REPAIR OR REPLACEMENT IS THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY.

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This Warranty is subject to any existing conditions of supply which may directly affect WOODS' ability to obtain materials or manufacture replacement parts.

No agent, representative, dealer, distributor, service person, salesperson, or employee of any company, including without limitation, WOODS, its authorized dealers, distributors, and service centers, is authorized to alter, modify, or enlarge this Warranty.

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